Economic Evaluation of Water Management Alternatives

Screening Analysis and Scenario Development

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Contents

Chapter | Page

1. Summary **1-1**
1.1 Purpose 1-1
1.2 Approach 1-1
1.2.1 Supply 1-2
1.2.2 Demand 1-2
1.2.3 Preference Sets 1-3
1.2.4 Screening Analysis 1-3
1.2.5 Uncertainty 1-3
1.3 Results 1-4
1.3.1 Unconstrained Scenario 1-4
1.3.2 Stakeholder Scenarios 1-4
1.3.3 Sensitivity Analyses 1-11

2. Approach **2-1**
2.1 Stakeholder Preference Sets 2-2
2.2 Demand Functions 2-2
2.3 Supply Data 2-7
2.4 Other Analysis Issues 2-7
2.5 Supply and Demand Screening Analysis and Scenario Development 2-7
2.6 Integrated Economic and Hydrologic Evaluation 2-8

3. Preference Sets **3-1**

4. Baseline Assumptions and Methods **4-1**
4.1 Common Assumptions 4-1
4.2 Demand Assumptions (Year 2020) 4-1
4.2.1 Municipal 4-1
4.2.2 Agricultural 4-3
4.3 Supply Assumptions (Year 2020) 4-8
4.3.1 Municipal 4-8
4.3.2 Agricultural 4-8

5. New Supply Data **5-1**
5.1 Urban Water-Use Efficiency 5-1
5.2 Agricultural Water-Use Efficiency 5-1
5.3 Urban Recycling 5-2
5.4 Land Fallowing 5-2
5.5 Active Conjunctive Use 5-8
5.6 Surface Storage 5-9

5.7 Other 5-9

6. Scenario Implementation 6-1
6.1 Methods 6-1
6.2 Retail Water Pricing 6-1
6.3 Availability and Allocation 6-2
6.4 Price and Quantity Adjustments 6-5
6.4.1 Water Quality Costs 6-6
6.4.2 Water Quality Costs without the Isolated Facility 6-8
6.4.3 Water Quality Costs with the Isolated Facility 6-9
6.4.4 Isolated Facility Costs 6-10
6.4.5 The Effect of Water Quality and Isolated Facility Costs on Screening of New Supplies 6-10
6.4.6 Delta Loss Factor 6-11
6.4.7 Reapplication Factor 6-11
6.4.8 Transport Cost 6-12
6.4.9 Water-Use Efficiency and Recycling Avoided Cost 6-12
6.4.10 Wastewater Discharge Avoided Cost 6-13
6.4.11 Transaction Fee 6-13
6.4.12 Price and Quantity Adjustments Summary 6-13
6.5 How Preference Sets Affect the Selection of Supply Options 6-14

7. Results 7-1
7.1 Interpreting the Demand and Supply Graphs and the Supply Data Tables 7-1
7.2 Unconstrained Preference Set 7-2
7.2.1 San Francisco Bay Region 7-2
7.2.2 South Coast Region 7-2
7.2.3 Sacramento River Region 7-10
7.2.4 San Joaquin River Region 7-10
7.2.5 Tulare Lake Region 7-10
7.3 Environmental Preference Set 7-10
7.3.1 San Francisco Bay Region 7-10
7.3.2 South Coast Region 7-10
7.3.3 Sacramento River Region 7-10
7.3.4 San Joaquin River Region 7-11
7.3.5 Tulare Lake Region 7-11
7.4 Urban Delta Exporters Preference Set 7-11
7.4.1 San Francisco Bay Region 7-11
7.4.2 South Coast Region 7-11
7.4.3 Sacramento River Region 7-11
7.4.4 San Joaquin River Region 7-12
7.4.5 Tulare Lake Region 7-12
7.5 Urban In-Delta Diverters Preference Set 7-12
7.5.1 San Francisco Bay Region 7-12
7.5.2 South Coast Region 7-12
7.5.3 Sacramento River Region 7-12
7.5.4 San Joaquin River Region 7-12

7.5.5 Tulare Lake Region 7-12
7.6 Delta Agriculture Preference Set 7-12
7.6.1 San Francisco Bay Region 7-12
7.6.2 South Coast Region 7-13
7.6.3 Sacramento River Region 7-13
7.6.4 San Joaquin River Region 7-13
7.6.5 Tulare Lake Region 7-13
7.7 Sacramento Valley Agriculture Preference Set 7-13
7.7.1 San Francisco Bay Region 7-13
7.7.2 South Coast Region 7-13
7.7.3 Sacramento River Region 7-14
7.7.4 San Joaquin River Region 7-14
7.7.5 Tulare Lake Region 7-14
7.8 San Joaquin Valley Agriculture Preference Set 7-14
7.8.1 San Francisco Bay Region 7-14
7.8.2 South Coast Region 7-14
7.8.3 Sacramento River Region 7-15
7.8.4 San Joaquin River Region 7-15
7.8.5 Tulare Lake Region 7-15

8. Discussion 8-1
8.1 Summary and Interpretation of Results 8-1
8.1.1 South Coast Region 8-1
8.1.2 San Francisco Bay Region 8-2
8.1.3 Sacramento River Region 8-2
8.1.4 San Joaquin River Region 8-2
8.1.5 Tulare Lake Region 8-11
8.1.6 Summary of Scenario Costs 8-11
8.2 Uncertainty and Sensitivity Analysis 8-11
8.2.1 Unconstrained Preference Set with Isolated Facility 8-15
8.2.2 Market Incentive on Land Fallowing Options 8-16
8.2.3 Delta Loss Factor for Transfers 8-16
8.2.4 Yield from Surface Storage 8-25
8.2.5 Active Conjunctive Use Feasibility 8-25
8.2.6 Membrane Treatment Cost Sensitivity Analysis 8-25
8.2.7 Ultraviolet Radiation Treatment Cost Sensitivity Analysis 8-26
8.2.8 Urban Delta Exporters Preference Set with Isolated Facility 8-26
8.2.9 Urban Demand Elasticity Sensitivity Analysis 8-27
8.2.10 Urban Demand Forecast Sensitivity Analysis 8-27
8.2.11 Other Uncertainties 8-28
8.2.12 Baseline Assumptions on Environmental Water Acquisition 8-28
8.2.13 Colorado River Options 8-31
8.2.14 Operational Feasibility 8-31
8.3 Subsidies 8-31
8.4 Other Impacts of Supply Options 8-32
8.5 Uncertainty and the Ranking of Options 8-32

9. Next Steps 9-1
9.1 Water Projects Operations 9-1
9.2 Refined Cost and Quantity Estimates for Water Supply Options 9-1
9.3 Water Quality Effects on Water Supply Quantity and Costs 9-1
9.4 TDS Analysis for South Coast Demand Region 9-2
9.5 Refined Environmental Water Supply Quantities 9-2
9.6 Expanded Regional Economic Impacts Analysis 9-2
9.7 Cost Allocation Strategies 9-2
9.8 "Practicability" and Local Interests Inventory 9-3
9.9 Implementation Plan for 2010 9-3
9.10 Retail Water Pricing and Cost Recovery Mechanisms 9-3

10. References 10-1

Appendices

A Demand-Supply Graphs and Tables
B Regional Economic Impacts

Tables

1-1 Summary of New Water Supplies for the Unconstrained Preference Set 1-5

3-1 Summary of Stakeholder Preference Sets 3-3

4-1 Demand Data and Calculations to Develop Demand Functions Used in the Screening Analysis 4-3
4-2 Results of Parametric Estimation of Agricultural Water Demand Elasticities 4-7
4-3 Data and Calculations to Develop Agricultural Demand Functions Used in the Screening Analysis 4-8
4-4 Calculations to Obtain Baseline Supply Levels in Municipal Regions 4-9
4-5 Average and Dry Conditions for Applied Irrigation Water by Central Valley Region 4-9

5-1 Supply Data at Source 5-3

6-1 Calculation of Cost Recovery Additive Used to Obtain Retail Price[a] 6-2
6-2 Municipal Water CVP Contracts and SWP Entitlements for Water Diverted from the Delta 6-3
6-3 Basis for Allocation Shares 6-4
6-4 Share of New Supply Options 6-4
6-5 Screening Analysis Water Quality Costs without and with an Isolated Facility[a] 6-7
6-6 How Delta Water Quality Affects Screening and Sensitivity Analyses 6-10
6-7 Reapplication Factors for Each Demand Region 6-12
6-8 Water Transport Costs ($/AF) 6-12
6-9 Price-Quantity Adjustment Formulas 6-13
6-10 Price Quantity Adjustment Data 6-14

D-013406

D-013406

7-1 Supply Data for Screening Level Analysis, Unconstrained Preference Set South Coast Region 7-5
7-2 Supply Data for Screening Level Analysis, Unconstrained Preference Set Tulare Lake Region 7-9

8-1 Summary of Total, Average, and Marginal Retail Cost of New Dry-Year Supply 8-12
8-2 Development of Sensitivity Analysis of Water Needs. Demand and Supply Forecasts for the 1 in 5 Condition (Range of Uncertainty in Population Levels is 3 Percent) 8-29

Figures

1-1 New, Dry-Year Supply by Scenario, Total for Urban Demand Regions 1-7
1-2 New, Dry-Year Supply by Scenario, Total for Agricultural Demand Regions 1-9
1-3 Sensitivity Analysis on Unconstrained Scenario, Total for Urban Demand Regions 1-13
1-4 Sensitivity Analysis on Urban Demand, Total for Urban Demand Regions 1-15

2-1 Approach to Water Management Scenario Development 2-3
2-2 Agricultural and Urban Demand Regions 2-5

4-1 Central Valley Agricultural Production and Transfer Model Regions Used to Estimate Agricultural Water Demands 4-5

7-1 Screening Level Analysis, Unconstrained Preference Set, South Coast Region 7-3
7-2 Screening Level Analysis, Unconstrained Preference Set, Tulare Lake Region 7-7

8-1 New, Dry-Year Supply by Scenario, South Coast Region 8-3
8-2 New, Dry-Year Supply by Scenario, San Francisco Bay Demand Region 8-5
8-3 New, Dry-Year Supply by Scenario, Sacramento River Demand Region 8-7
8-4 New, Dry-Year Supply by Scenario, San Joaquin River Demand Region 8-9
8-5 New, Dry-Year Supply by Scenario, Tulare Lake Demand Region 8-13
8-6 Sensitivity Analyses on Unconstrained Scenario, Total for South Coast Demand Regions 8-17
8-7 Sensitivity Analyses on Unconstrained Scenario, San Francisco Bay Demand Region 8-19
8-8 Sensitivity Analyses on Urban Demand, South Coast Demand Region 8-21
8-9 Sensitivity Analyses on Urban Demand, San Francisco Bay Demand Region 8-23

Chapter 1

Summary

1. Summary

1.1 Purpose

The purpose of CALFED's Economic Evaluation of Water Management Alternatives (EEWMA) is to provide an initial screening, based on cost-effectiveness, of different combinations of water management options to meet California's anticipated agricultural and urban water demand in 2020. The evaluation provides information on the likely magnitude of 2020 agricultural and urban demands, how demands are affected by the future price of water, the supplies available to meet those demands, and the most cost-effective combination of those supplies. In this analysis, cost-effective is defined as the least costly mix of water supply measures for which a user is willing to pay.

Many of the cost and yield estimates used in this evaluation are reconnaissance level and do not reflect detailed hydrologic and engineering studies. Therefore, the results in this report cannot be used to make final decisions on water management strategy. Results do indicate that, based on this level of analysis, no water management option types or management scenarios can be eliminated from further assessment. More detailed hydrologic and economic assessments are recommended to further the assessment.

1.2 Approach

The approach used in this analysis was developed, with input from stakeholders and economists, to analyze supply and demand at a screening level of detail using existing information and accounting for uncertainty. It includes the development of supply data, demand functions, and preference sets. A screening analysis, using this information, then produces water supply scenarios.

Existing sources of information include reports and unpublished information from CALFED, the California Department of Water Resources (DWR), the U.S. Bureau of Reclamation (Reclamation), and numerous other agencies. Stakeholders also provided additional information and documentation on subjects, including 2020 water demand, the costs of water transport, treatment, and distribution, market incentives, and supply measures.

Dry-year supply and demand conditions were used for the evaluation. Depending on the source of information, the dry condition was defined as the 20 percent (i.e., one-in-five) driest years or the average condition during the 1928-34 critical period.

This report documents:

- The identification of supply measures (cost and quantity) available to meet demand
- The 2020 agricultural and urban demands for water, or "willingness-to-pay"
- The development of stakeholder water management preference sets

- The lists of the most cost-effective supply measures (scenarios) necessary to meet demands subject to preference sets.

1.2.1 Supply

Supply data were developed by identifying individual supply measures. Water supply measures are specific individual projects or actions; they are characterized with regard to dry-year water supply and cost. Water supply measures are grouped into option types. Water supply option types include urban and agricultural water-use efficiency (WUE), urban recycling, land fallowing, active conjunctive use, new surface storage, and other measures, such as Colorado River deliveries, South Delta improvements, and local projects, including desalination.

In this analysis, the term "water transfers" refers to the means by which water supply from any measure can be transported from its place of origin to a place of use. This is in contrast to restricting water transfers to only those supplies made possible through agricultural water conservation or land fallowing.

1.2.2 Demand

Demand functions were developed for agricultural and urban water users. The demands for water are expressed in terms of the price of new water supply and a water user's willingness to purchase that supply. The demand regions include agricultural regions (Tulare Lake, Sacramento River, and San Joaquin River) and urban regions (San Francisco Bay and South Coast).

Urban Best Management Practices (BMPs) and agricultural Efficient Water Management Practices (EWMPs) are assumed to have been implemented. Demand in each region is assumed to have been reduced by the corresponding amount. Urban BMPs total 804 thousand acre-feet (TAF) and agricultural EWMPs total 396 TAF.

In this analysis, environmental water demand is assumed to have been met before meeting 2020 agricultural and urban demands. The Central Valley Project Improvement Act (CVPIA) Programmatic Environmental Impact Statement (PEIS) (Reclamation, 1997) evaluated environmental demand at up to 710 TAF, in addition to water that has already been reallocated to the environment. The annual cost of acquiring that water is estimated to be $142 million (Chapter 5). Because the CALFED Environmental Restoration Program (ERP) is not complete, the 710 TAF estimate is used in this analysis. It is assumed that the least expensive water from land fallowing would be purchased from willing sellers to meet environmental demand. Consequently, the least expensive land fallowing is not available to meet 2020 agricultural and urban water demand.

It should be noted that the precise mechanism to meet environmental demand or provide environmental water has not been resolved. If the assumed water purchases for environmental restoration do not occur, then the less expensive water from land fallowing would be available for meeting agricultural and urban demand.

1.2.3 Preference Sets

The preference sets were developed for an unconstrained condition and for various stakeholders. By definition, the unconstrained condition refers only to water supply options and does not limit the inclusion of any particular option type.

The stakeholder's preference set reflects a stakeholder's judgment about the desirability of different water supply option types. Stakeholder groups include Environmental, Urban Delta Exporters, Urban In-Delta Diverters, Delta Agriculture, Sacramento Valley Agriculture, and San Joaquin Valley Agriculture. These stakeholder judgments are translated into "rules" or requirements to include or exclude particular water supply option types or portions thereof. The preference sets also specify rules for cost allocation and pricing of new water supply. Allocation of costs captures stakeholder preferences regarding subsidies and the distribution of costs among beneficiaries.

Consistent with CALFED principles and policies, an isolated facility for conveying water across the Delta is not included as a potential water supply measure in the main preference sets. An isolated facility does improve the quality of water that is exported from the Delta and, given current water treatment technology, reduces the cost of supplying water to the urban end user. The cost and water quality implications of an isolated facility are assessed in a set of sensitivity analyses in this report.

1.2.4 Screening Analysis

Scenarios are developed from the screening analysis utilizing the supply data, demand functions, and stakeholder preference sets. The screening analysis links supply measures with demand regions and adjusts for costs at the place of use. The cost adjustments, either cost savings or additional costs, include the cost for transporting the water to its destination for use, the cost for reapplication and water quality, and the cost for treatment and distribution. A list of the most cost-effective supply measures necessary to meet demand, subject to a stakeholder preference set, is then developed for each stakeholder and the unconstrained condition. This list of water supply measures is a scenario.

1.2.5 Uncertainty

Planning for future California water demand must include consideration of uncertainty. Sources of uncertainty include future demand and institutional conditions, future technology, and uncertainty in regard to the current supply and cost estimates. Although the time frame for this analysis is 2020, California's water demand will continue to grow, and planning beyond 2020 is necessary. The preference sets capture a range of uncertainty regarding the implementability of water supply option types and uncertainty about future policies, regulations, and laws. To further address uncertainty, sensitivity analyses were performed addressing the isolated facility, water treatment technology and cost, market incentives for land fallowing, Delta loss factors, urban demand elasticities and forecasts, supply from new surface storage, and conjunctive use.

Other features of water management, such as flexibility and avoiding irreversible changes in the environment, are not quantified or considered in this report. They should be considered in CALFED decisionmaking along with costs and other planning criteria.

1.3 Results

1.3.1 Unconstrained Scenario

Table 1-1 shows the least costly supply options for which urban and agricultural water users are willing to pay. Urban demand is met when marginal retail costs are slightly greater than $1000 per acre-foot. Water supply measures from all option types are included in the Unconstrained scenario for new urban water supply.

The least expensive measures ($400 to $800 per acre-foot) are represented by these option types: urban recycling; urban and agricultural WUE; and other measures (Colorado River Aqueduct deliveries, South Delta improvements, and local projects). This group of measures provides approximately 866 TAF of new water supply.

Almost 2 million acre-feet (MAF) of new urban water supply is available in the retail cost range of $800 to $1200 per acre-foot. The supply function is relatively flat in this cost range. Given the uncertainty in both the supply and demand data used in this analysis, there is little basis to differentiate supply measures in this range based solely on costs. For example, it is possible to eliminate either new surface storage or land fallowing from consideration and still meet demand without a great effect on price. On the other hand, there is no cost reason to eliminate either of those option types from consideration.

It should be noted that all scenarios include significant amounts of supply from local supply measures, including recycling, conservation, local conjunctive use, and Colorado River supplies. For example, in the South Coast Region, over one million acre-feet (about 60 percent) of the new supply in the Unconstrained scenario would come from supply measures implemented within the Region.

Urban recycling is more cost-effective in the San Francisco Bay Region than in the South Coast Region because of the avoided cost of wastewater treatment and disposal. In the Unconstrained scenario, recycling makes up about 15 percent of new water supply in the South Coast Region. However, in the San Francisco Bay Region, recycling makes up about 50 percent of new water supply.

There is little willingness-to-pay (less than $200 per acre-foot) for new agricultural water supply. In the Unconstrained scenario there are few water supply measures available at that cost. No (or minimal) new supplies were identified for the Sacramento River and San Joaquin River Regions. Active conjunctive use, particularly the Kern Water Bank, is within the Tulare Lake Region's willingness-to-pay.

1.3.2 Stakeholder Scenarios

The scenarios developed from the various stakeholder preference sets show the following additional results, as summarized in Figures 1-1 and 1-2.

Urban demand is relatively unresponsive to changes in price. Inclusion of more costly measures in a scenario has little effect on total new urban water demand. Therefore, there is little change in total demand among the scenarios. Although the total demands are similar, the total dry-year cost for new urban supply, including costs for local treatment,

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TABLE 1-1
Summary of New Water Supplies for the Unconstrained Preference Set

Total Potential Demand for New Supplies in Each Region

Region	Demand (TAF)	Measures to Meet Demand: Option Types	Agricultural (TAF)	Urban (TAF)
South Coast (Urban)	1,764	Urban Recycling	0	318
San Francisco Bay (Urban)	212	Urban WUE	0	501
Sacramento River (Agricultural)	0	Agricultural WUE	4	97
San Joaquin River (Agricultural)	14	Land Fallowing	0	138
Tulare Lake (Agricultural)	400	Conjunctive Use	377	209
Total	**2,390**	Surface Storage	0	361
		Other (Canal Lining, Desalination, South Delta Improvements)	33	353

Cost Ranges for Available Supplies

	Marginal Cost Range (for End User)					
	$0 - $200	**$200 - $400**	**$400 - $600**	**$600 - $800**	**$800 - $1000**	**$1000 - $1200**
Urban Water Supply[a]						
New Supply Quantity	0 TAF	25 TAF	314 TAF	527 TAF	979 TAF	1009 TAF
Measures Include			Urban Recycling Agricultural WUE Urban WUE	Urban WUE Canal Lining Local Conjunctive Use Groundwater Desalination Urban Recycling Local Agricultural WUE	Agricultural WUE South Delta Improvements Urban Recycling Surface Storage Conjunctive Use Urban WUE Land Fallowing	Land Fallowing Conjunctive Use Groundwater Desalination Agricultural WUE Surface Storage Urban WUE
Agricultural Water Supply						
New Supply Quantity	414 TAF	0 TAF	0 TAF	0 TAF	0 TAF	0 TAF
Measures Include	Agricultural WUE South Delta Improvements Conjunctive Use					

[a] Urban water supply costs include cost for treatment, distribution, and urban overhead cost.

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distribution, and administrative overhead, ranges from $1.92 to $2.31 billion. The mix of option types also differs among the scenarios due to stakeholder preferences.

Urban WUE plays a substantial role (300 TAF to 400 TAF) in all of the scenarios except for the Urban Delta Exporter's scenario. Key Delta exporters believe, based on their best estimates of cost and effectiveness, that additional WUE beyond the planned BMPs would not be cost-effective in the South Coast Region. Therefore, additional urban WUE beyond planned BMPs was not included in the Urban Delta Exporter's scenario. Agricultural WUE is present in similar amounts across all of the scenarios.

Total costs are highest for the Urban Delta Exporters scenario due to assumptions of the preference set. In addition to the WUE assumption described above, the preference set assumes that the quantity of water requiring membrane treatment is more than twice the level in other preference sets, based on information provided by Metropolitan (1999a). This increases the water treatment cost significantly and increases brine losses from treated water. A sensitivity analysis indicates that an isolated facility would avoid this extra cost, reducing the dry-year cost of the Urban Delta Exporters scenario by $450 million.

There is sufficient urban WUE, urban recycling, and other measures (Colorado River Aqueduct deliveries, South Delta improvements, and local projects) to meet all urban demand without new Delta exports, but at a greater cost, as shown by the Delta Agriculture scenario. Without new Delta export, the total dry-year cost for new urban water supply increases from $1.92 billion per year (for the Unconstrained scenario) to $2.29 billion (for the Delta Agriculture scenario).

Active conjunctive use projects are included in all scenarios. For the Environmental preference set, half of the yield of conjunctive use projects, or 400 TAF, was assumed to be available for environmental uses.

New surface storage measures are present in scenarios where they are not specifically excluded (the Environmental scenario) or where more costly measures are required to be implemented first (the Delta Agriculture scenario). It should be noted that high-yield surface storage estimates were used for the stakeholder scenario analysis. The effect of using low-yield estimates is addressed in a sensitivity analysis.

Subsidized pricing (defined here as charging a price below the average cost per acre-foot of the water supply measure) is required if new surface storage water measures are to be available for agriculture. Agriculture is willing to pay for some new conjunctive use, agricultural WUE, and other measures (South Delta improvements) without subsidies. However, subsidies are also required to make the more expensive conjunctive use and agricultural WUE measures available to agricultural users. Two of the agricultural preference sets included new supply priced at current cost of CVP or SWP supply. Under this policy, agricultural users in a dry year would pay $70 to $75 million for water costing an average of $440 to $460 million to provide. If agricultural water supply is subsidized, urban water users are forced to use other, more expensive supply measures, so the cost for water to urban water users increases.

Figure 1-1
New, Dry-Year Supply by Scenario
Total for Urban Demand Regions
(Dry-year cost in millions shown above each bar)

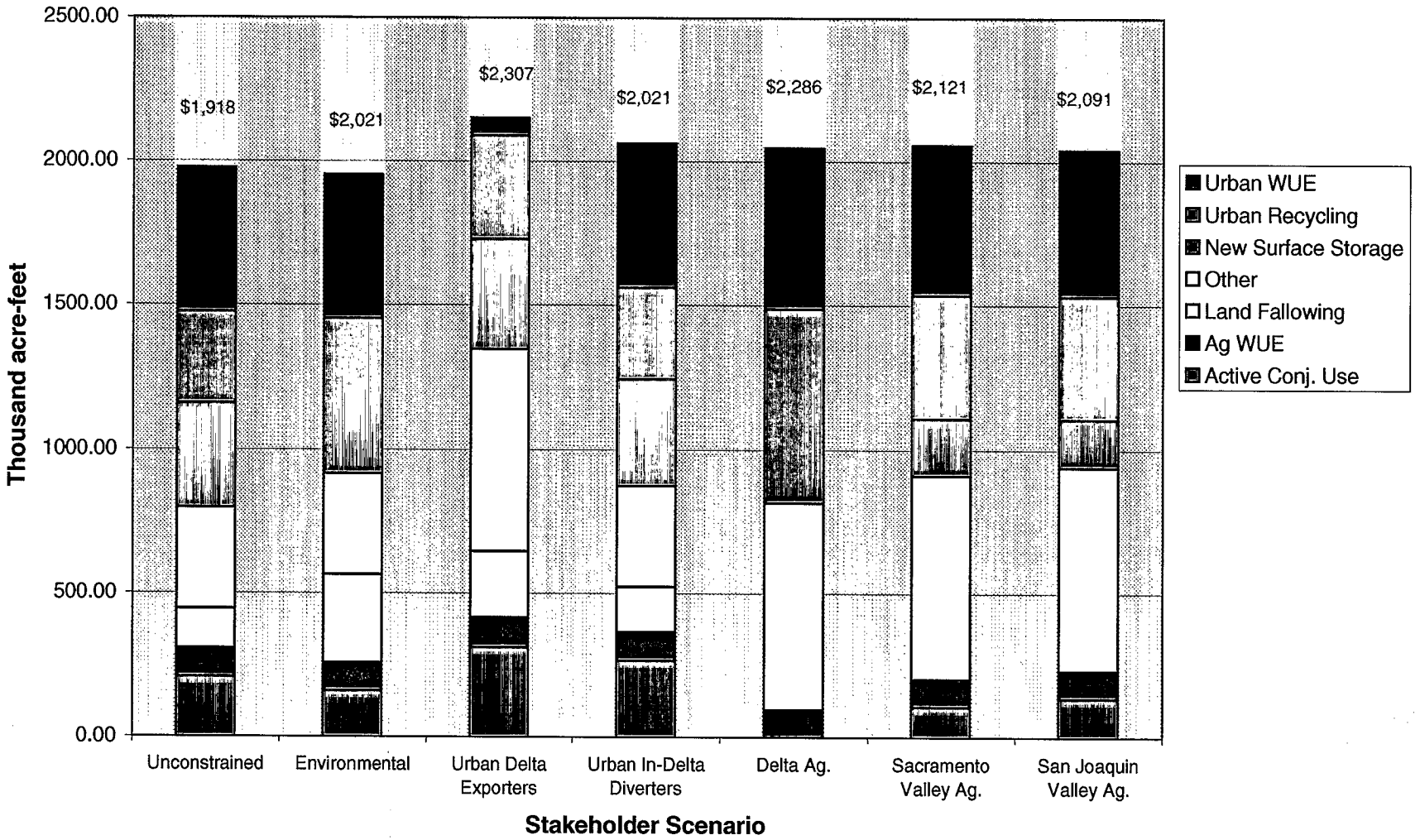

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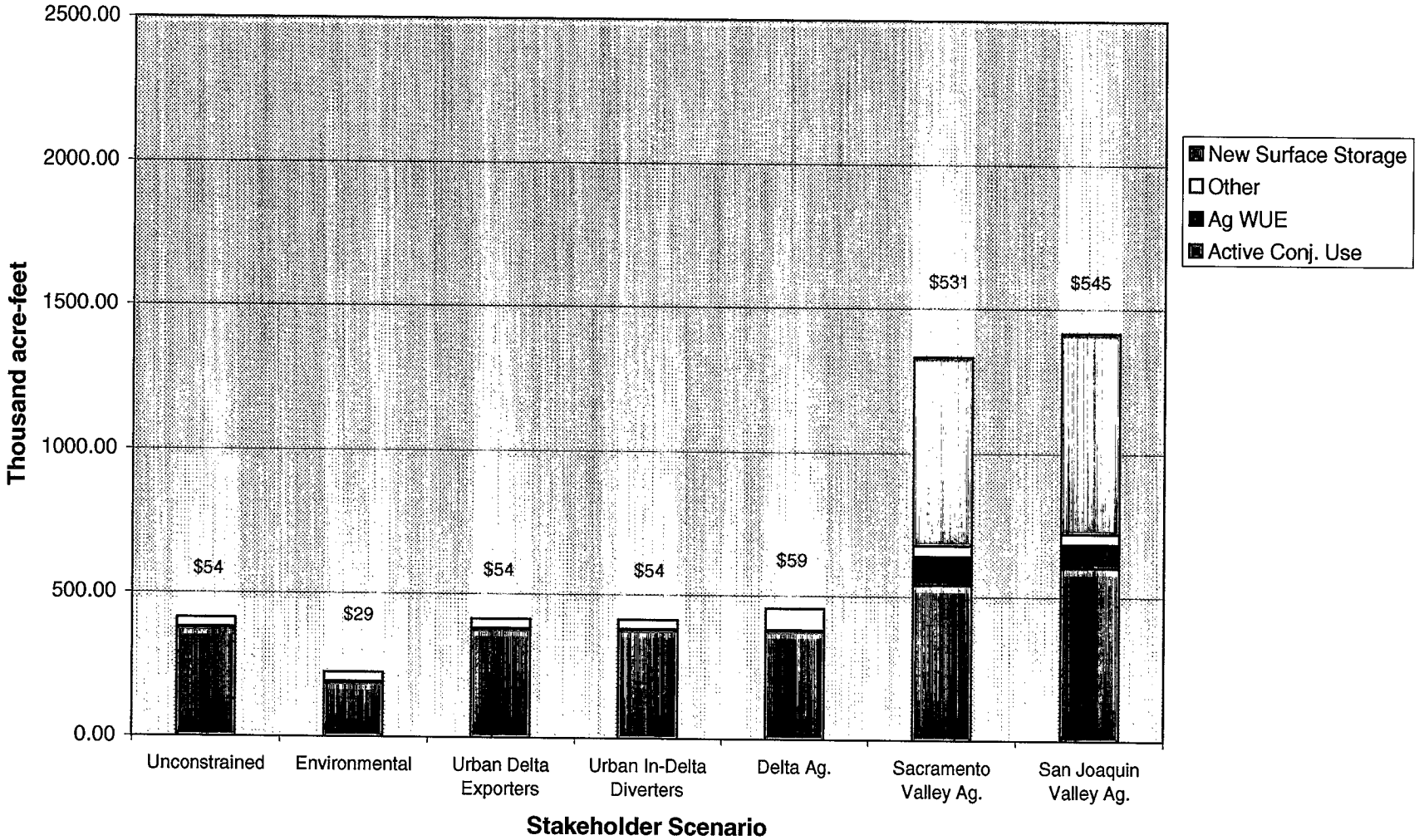
Figure 1-2
New, Dry-Year Supply by Scenario
Total for Agricultural Demand Regions
(Dry-year cost in millions shown above each bar)



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1.3.3 Sensitivity Analyses

The sensitivity analyses for urban demand regions are summarized in two figures. Figure 1-3 shows the Unconstrained scenario results compared to all of the sensitivity results related to supply quantities and costs. Figure 1-4 shows the Unconstrained scenario relative to the variations on urban demand forecast and elasticity.

1.3.3.1 Isolated Facility

When the isolated facility is included with the Unconstrained preference set, total costs of new supplies are reduced because of the assumed reduction in the costs of required treatment. The quantity of water exported to urban regions from the Delta increases and replaces urban recycling and WUE, which have lower cost-effectiveness. The isolated facility is assumed to decrease the treatment cost of water exported from the Delta because of improvements in raw water quality. The total urban water demand is also slightly lower with an isolated facility because of the avoided water losses associated with current treatment methods. However, if new and promising water treatment technology is proven, then these relationships may not hold (see 1.3.3.7 below).

1.3.3.2 Market Incentives for Land Fallowing

A market incentive of 100 percent is added to the foregone farming profit resulting from land fallowing; this represents an inducement for farmers to enter the market and a way to cover, in part, third party impacts. If the market incentive is reduced to 50 percent, there is a small increase in the cost-effectiveness of land fallowing, because the market incentive is only a small part of the total cost to the end user.

1.3.3.3 Delta Loss Factor

Initial screening of water supply measures was performed using a Delta loss factor of 35 percent. This factor was reduced to 20 percent after discussions with Delta experts and stakeholders. The result of this adjustment to the Delta loss factor was an increase in the cost-effectiveness of land fallowing and other water supply measures originating north of the Delta.

1.3.3.4 Supply from New Surface Storage

The supply data table shows high-yield and low-yield estimates for the supply and cost of each new surface storage water-supply measure. The screening analysis was conducted using the high-yield estimate. When the low-yield estimates were used instead, the quantity of supply from new surface storage was reduced, as would be expected. In addition, the most costly measure in the Unconstrained scenario was no longer cost-effective. The overall quantity decrease of supply from new surface storage was approximately 66 percent.

1.3.3.5 Active Conjunctive Use

Conjunctive use supply and cost estimates are relatively uncertain. Conjunctive use projects also have significant local and institutional unresolved issues. A sensitivity analysis was therefore conducted to analyze a worst-case situation in which no conjunctive use projects would be allowed. Results show that land fallowing and other local projects, such as brackish water desalination, become more cost-effective while agricultural and urban WUE, urban recycling, and new surface storage remain unchanged.

1.3.3.6 Membrane Treatment Cost

This analysis uses different membrane treatment capacity and cost estimates provided by Metropolitan in May of 1999 (Metropolitan, 1999a). The amount of treatment capacity required in the South Coast is increased, but the unit capital and operating costs are less than those included in the Unconstrained preference set. Results are similar to the Unconstrained preference set, except that average retail water costs in the South Coast are increased and about 115,000 AF more supply is needed to replace brine losses.

1.3.3.7 Ultraviolet Radiation Treatment Cost

This analysis assumes that ultraviolet radiation (UV) will become a viable alternative for meeting drinking water disinfection requirements under 2020 water quality criteria. UV is assumed to be relatively inexpensive, so average and marginal water costs are reduced substantially. Lower costs increase demand, but less water is needed because there are no membrane treatment brine losses. The increase in demand offsets the elimination of brine losses so the need for new supplies is about the same as in the Unconstrained preference set.

1.3.3.8 Urban Delta Exporters Preference Set with Isolated Facility

This sensitivity analysis includes the preference of urban delta exporters for an isolated facility. The isolated facility does not increase supply, but membrane treatment brine losses are eliminated, and water treatment costs are reduced.

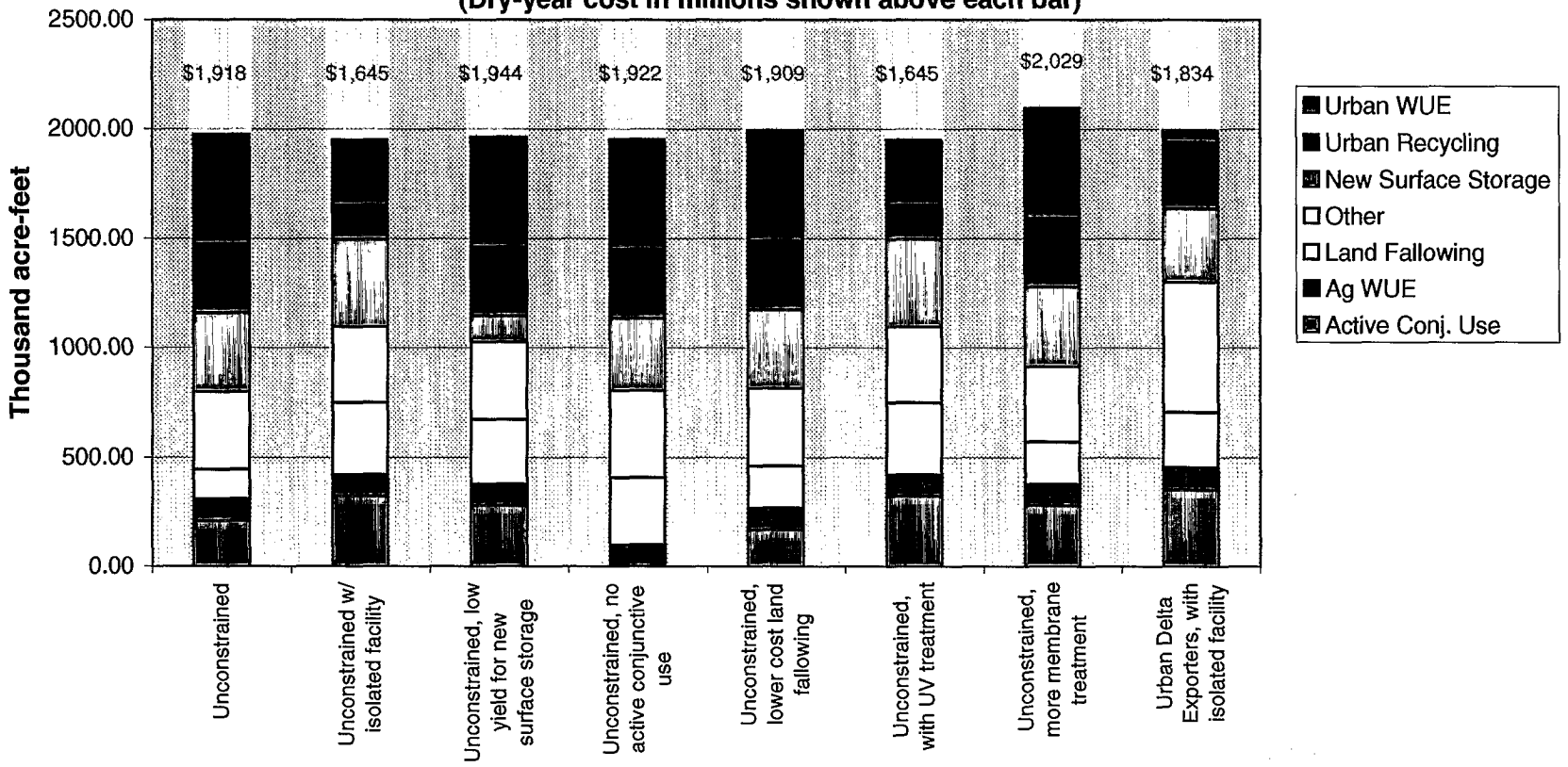
1.3.3.9 Urban Demand Elasticity

This analysis responds to uncertainty about the elasticity of urban water demand in 2020. Most comments about 2020 demand elasticity suggested that it may be larger (more price-responsive) than assumed. Therefore, the Unconstrained preference set for the two urban regions (San Francisco Bay Region and South Coast) were re-evaluated with demand elasticities of –0.1 and –0.2. Both of these assumptions reduce the amount of new supplies required to meet demand in 2020. If marginal cost pricing is used, the San Francisco Bay Region's use of new supplies with the –0.1 and –0.2 elasticities is reduced by 15 and 27 percent, respectively. In the South Coast Region, the corresponding reductions in new supplies are 8 and 21 percent. If average cost pricing is assumed, these reductions become much smaller, because the new supplies cause less of an increase in price.

1.3.3.10 Urban Demand Forecast

The 2020 demand for additional urban water supply depends on uncertain factors, such as population, climate, and operations. To consider these uncertainties, a range of forecasts for new urban supplies was developed. The selected range was the baseline forecast plus or minus 120 TAF in the San Francisco Bay Region and plus or minus 900 TAF in the South Coast Region. This forecast range has a large effect on the amount and cost of new supplies. The range exceeds almost all of the variation across preference sets and other sensitivity analyses and suggests that factors affecting baseline demands and supplies may be as important as the choice of new supply options.

Figure 1-3
Sensitivity Analysis on Unconstrained Scenario
Total for Urban Demand Regions
(Dry-year cost in millions shown above each bar)



Variation on Unconstrained Scenario

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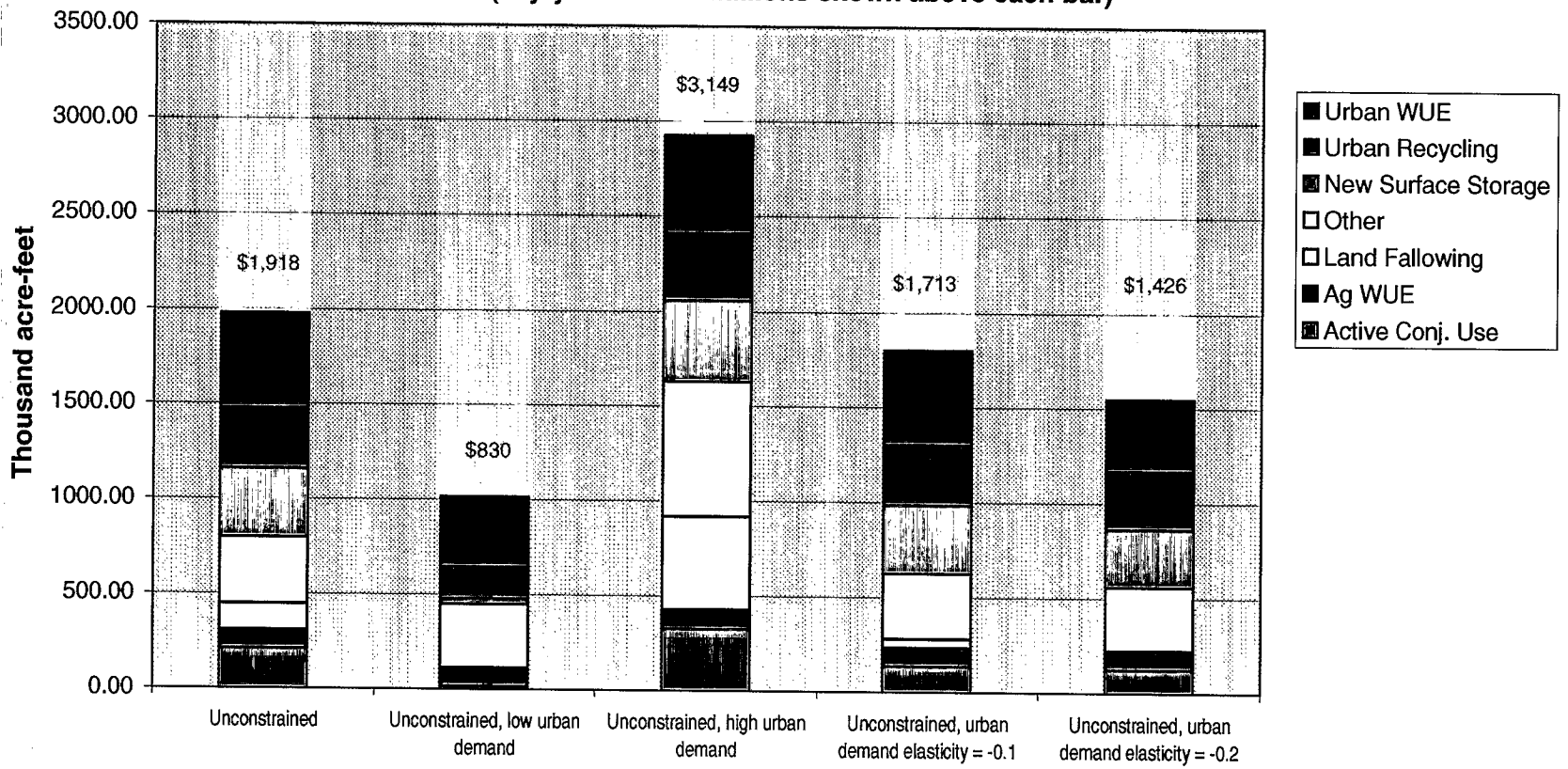
Figure 1-4
Sensitivity Analysis on Urban Demand
Total for Urban Demand Regions
(Dry-year cost in millions shown above each bar)



Variation on Unconstrained Scenario

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Chapter 2

Approach

2. Approach

This chapter describes the approach taken in the EEWMA to analyze the cost-effectiveness of different combinations of water supply and demand management measures. The approach consisted primarily of:

- The development of stakeholders' water management preferences
- The conversion of preferences into well-defined screening criteria
- The identification of costs and quantities of feasible water supply and demand management options
- The screening of the options to create a set of water management scenarios

Figure 2-1 is a flow diagram that summarizes the EEWMA approach. It shows the many components of the scenario development process and how they interact. Each component (shown as a box on the flow diagram) is introduced and described briefly in this chapter. Detailed descriptions of the components follow in later chapters.

Stakeholder participation was an important feature of the EEWMA scenario development process. Monthly meetings were held in Sacramento to present new information and analyses and to solicit discussion and guidance. Stakeholders provided important information on the costs and quantities of water potentially available for some options. In addition, numerous individual stakeholder meetings, conference calls, and other forms of correspondence were used to promote the open flow of information.

Throughout this evaluation, an important distinction is maintained between preferences and information. Preferences vary among the stakeholder groups; this variation is represented by the restrictions or emphases on supply option types used in the different scenarios. Information is intended to be objective and constant across all scenarios.

Most of the information used in this evaluation is demand or supply data. The quality of information varies significantly, ranging from well-documented studies to expert judgment. It was intended that evaluation would rely on existing information; some stakeholders developed and provided new information and documentation that was incorporated into the data sets.

In the screening analysis, the least-cost combinations of CALFED water supply measures (including demand management) are identified subject to:

- The constraints and preferences expressed by stakeholders
- The regional urban and agricultural demand functions
- The best cost and quantity estimates available for supply measures

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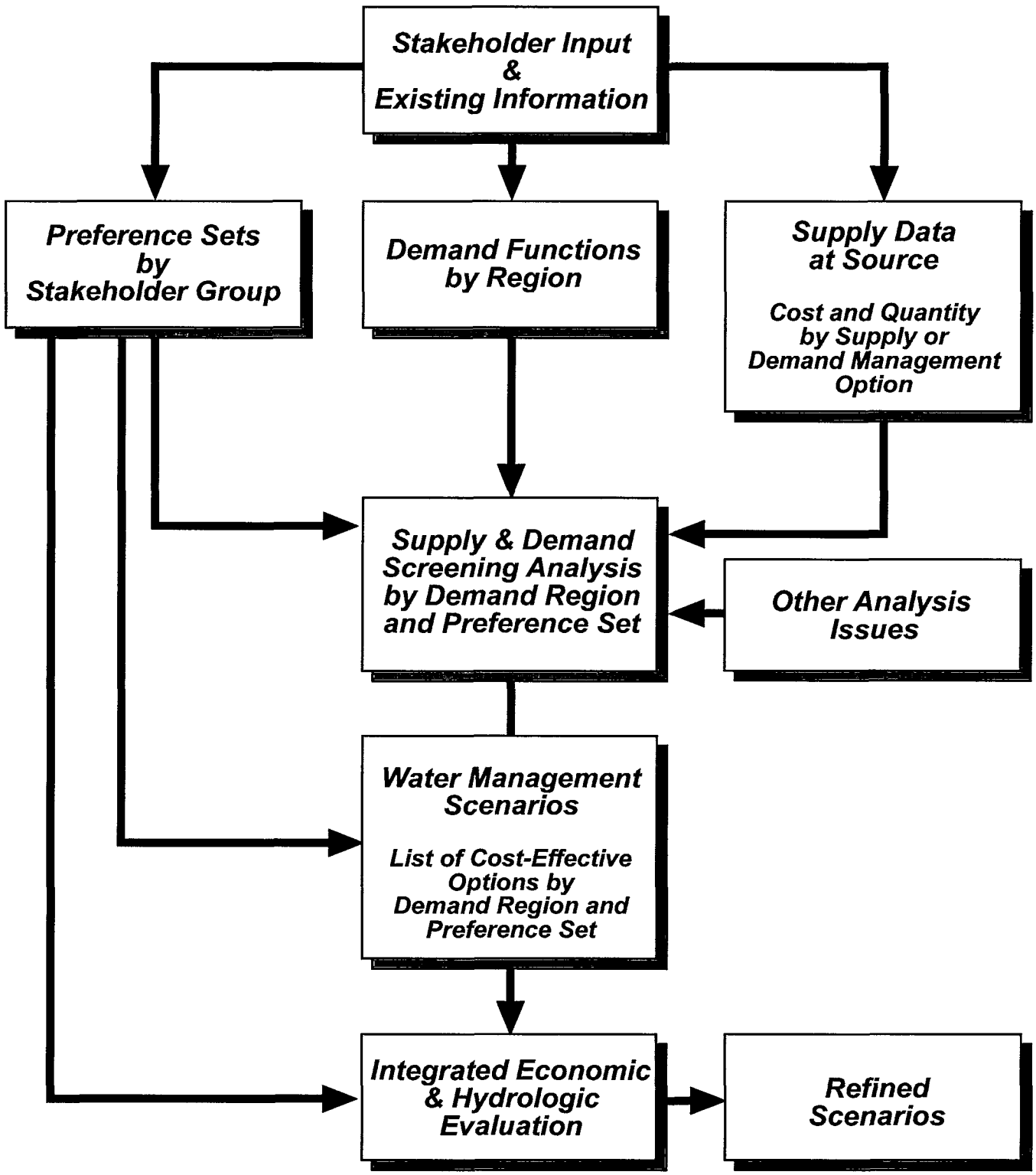

Figure 2-1
Approach to Water Management Scenario Development

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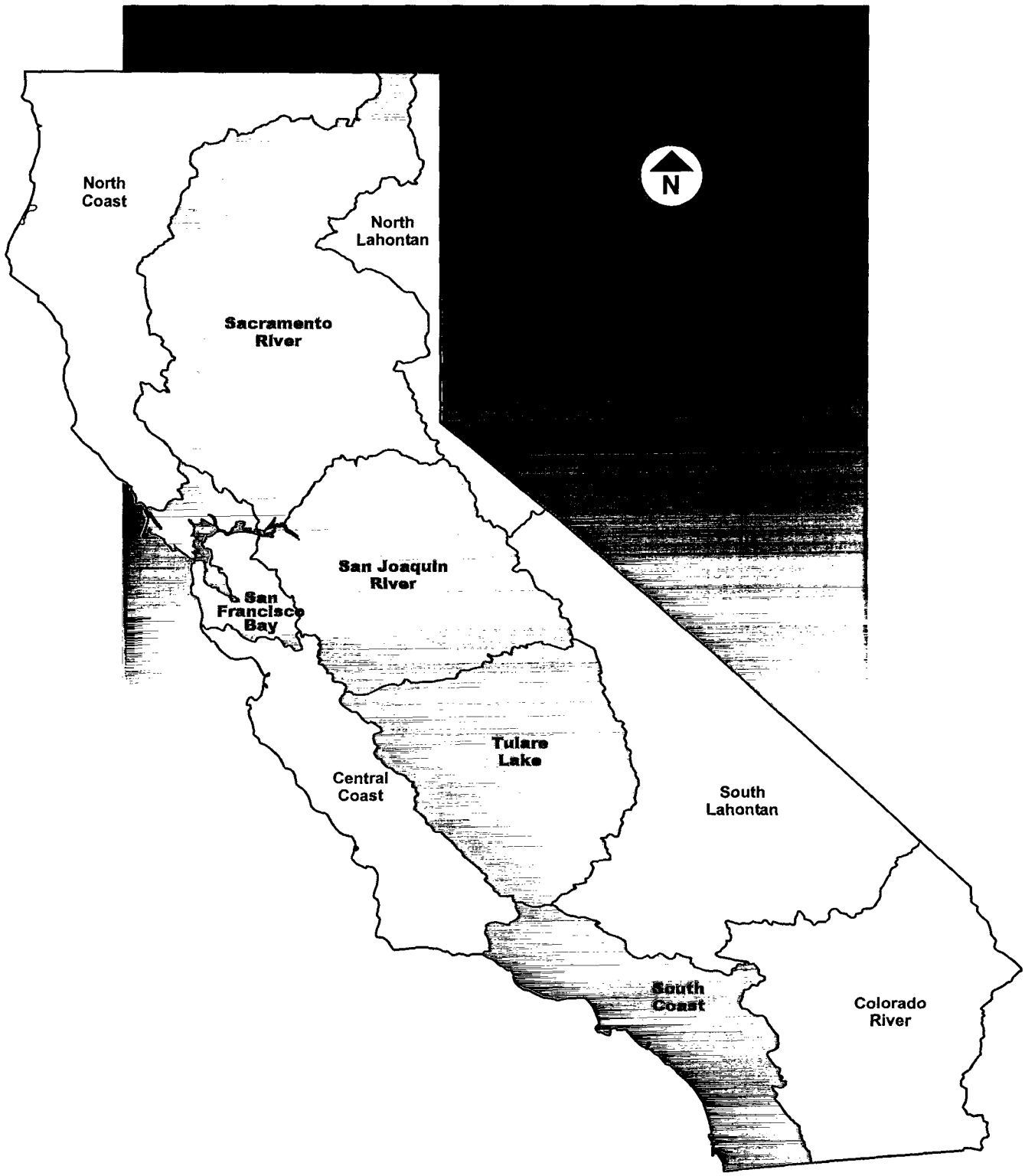

Figure 2-2
Agricultural and Urban Demand Regions

2.3 Supply Data

Supply data are the costs and quantities of different water supply or demand management measures. For each measure, cost and quantity at the source are adjusted to account for transaction costs, transport losses, and other cost and quantity adjustment factors. Adjustments depend on both the source of the supply and the location of the demand.

The supply measures and their costs and yields are presented in Chapter 5, New Supply Data. More detail about cost and quantity adjustments is provided in Chapter 6, Scenario Implementation.

2.4 Other Analysis Issues

Several other issues related to data, approach, and assumptions were raised during the study. These issues, which lacked an acceptable level of analysis or data and therefore required more study, included groundwater management, demand elasticity, market effects and profit from water transfers, and water treatment costs.

Groundwater management was not part of CALFED's mission; thus, it is not included as a goal or constraint in the economic evaluation. The analyses of other issues are described in appropriate parts of this report.

2.5 Supply and Demand Screening Analysis and Scenario Development

The initial plan of study called for a relatively quick and approximate screening of supply measures for each of the preference sets. This was to be accomplished using a spreadsheet to rank and select measures separately for each demand region. The resulting list of candidate measures was then to be assessed more comprehensively using the Central Valley Production and Transfer Model (CVPTM) to incorporate all demand regions and account for transport costs and losses.

As the screening analysis progressed, it became more sophisticated and comprehensive, and the additional benefit provided by the CVPTM modeling analysis diminished. CVPTM analysis was therefore postponed and reserved for use as part of an integrated economic and hydrologic evaluation, as described below. The primary reasons for this decision were:

- The CVPTM data and sensitivity analyses provide important information for the screening analysis, including water supplies and costs available from land fallowing, agricultural demands for new water supplies, and the costs of and losses from transferring water between regions.
- The screening analysis allocates supply measures among potential demand regions using two different allocation rules. Therefore, each demand region is evaluated in conjunction with all other demands (one of the important benefits of using the CVPTM).

- Because the CVPTM and the screening analysis use essentially the same data, the water supply measures identified by the two approaches are bound to be virtually identical. This was verified when the CVPTM was used to evaluate the unconstrained scenario.

The outcome of the screening analysis, which is described in Chapter 7 and discussed in Chapter 8, was a set of supply and demand scenarios that met the conditions established by each preference set at minimum cost. A series of demand-supply graphs and tables was created to illustrate the scenarios; these graphs and tables are provided in Appendix A. One scenario was developed for each preference set. Water supplies, locations, and costs were displayed for the scenarios.

The preliminary results of the screening were then reviewed with the stakeholder representatives, who were given an opportunity to modify their stated preferences if they chose. Sensitivity analyses were developed to highlight some key areas of uncertainty.

Concerns were raised about adverse regional, third-party impacts that might result from options involving the transfer of water out of an existing use. In particular, the impacts of water made available from fallowing agricultural land were questioned. A regional economic input-output model (IMPLAN) was used to assess these impacts on a preliminary basis. The results of the IMPLAN analysis, which are described in Appendix B, were not directly incorporated into the screening analysis.

2.6 Integrated Economic and Hydrologic Evaluation

It was an important limitation of the screening analysis that hydrologic constraints or impacts were not considered comprehensively. Some assumptions were made, for example, about Delta pumping capacity and feasible transfers of new or existing water supplies. It was recognized from the start of the study that scenarios would have to be subjected to a more integrated evaluation.

Therefore, scenarios developed in the screening evaluation will be analyzed using an integrated economic and hydrologic evaluation procedure currently being developed and tested. The procedure will link the California operations planning model (DWRSIM) with a conjunctive surface and groundwater model (CVGSM) and with two economic models: CVPTM and the Least-Cost Planning Simulation Model (LCPSIM). CVPTM will be used to assess agricultural water supply costs, benefits, and associated land-use impacts resulting from new supplies or transfers of existing supplies. LCPSIM will be used to estimate least-cost urban water supplies under different assumptions about local conservation, drought contingencies, and water transfer activities.

The outcome of the integrated evaluation will be a refined set of scenarios, and potentially some new scenarios, that will assist CALFED in planning and policy decisions.

Chapter 3

Preference Sets

3. Preference Sets

Stakeholder groups have different opinions about how water supply reliability should be improved. To convert those opinions into the elements of water supply scenarios, it was necessary to define them and quantify them relative to availability and cost.

Stakeholder groups were identified based on previous input they had provided to the CALFED planning process. The participating groups were:

- Environmental Groups
- Urban Delta Exporters
- Urban In-Delta Diverters
- Delta Agriculture
- Sacramento Valley Agriculture
- San Joaquin Valley Agriculture

Stakeholders themselves decided whether and how to combine individual opinions into a common preference set. In addition to the stakeholder preference sets, an "Unconstrained " preference set was developed to provide a base against which the effect of different stakeholder preference sets could be measured.

Stakeholder preferences were developed by reviewing written comments the groups had made on previous DWR and CALFED water supply planning efforts, by reviewing recent verbal comments, and by interviewing representatives of each group. Preferences were specified for each of the water supply option types, for cost, and for water allocation (see Table 3-1). The stakeholder groups were given the opportunity to revise and refine their preference sets as they saw the implications of their preferences on water supply scenarios.

The preference sets are shown in Table 3-1. All preferences regarding water supply option types are characterized as minimum, maximum, or unconstrained. If a supply option is "unconstrained," any supply measure within that option type will be included in a scenario if it is cost-effective. A water supply measure is considered cost-effective if it is the least costly measure for providing the next increment of water supply needed to meet demand.

"Minimum" identifies the supply quantity required to be included in a water supply scenario, regardless of the cost. For example, if a preference set specifies a minimum quantity for urban WUE, the water supply scenario includes that amount as a minimum, using the least expensive units available. Additional urban WUE measures are included if they are cost-effective.

"Maximum" identifies the supply quantity that cannot be exceeded, even if additional measures are cost-effective. For example, if a preference set specifies a maximum amount for land fallowing, the water supply scenario includes no more than that amount. Land fallowing measures are included in the water supply scenario only up to the maximum amount, or to the amount at which all supplies meet demand, whichever is reached first. Water allocation preferences affect the amount of water provided to each of several demand regions when a supply measure is cost-effective for all of them. Water allocation rules did

not become a strong differentiator of scenarios in this analysis. As explained in Chapter 6, a common water allocation routine is used across all stakeholder preference sets. The only deviation from this routine is that the Environmental preference set specifies that half of the yield from active conjunctive use is to be reserved for environmental purposes. To model this preference, water supplies from all active conjunctive use supply measures are halved.

Cost allocation preferences affect the amount of supply measure cost paid by each user. Cost allocation is an important differentiator for the agricultural preference sets, where substantial subsidies are required to make new conjunctive use and surface water supplies inexpensive enough to be used by agriculture. For Urban Delta Exporters, cost allocation is a less important differentiator for isolated facility costs. Retail water pricing became a significant issue during the stakeholder elicitation process. Two common types of pricing are marginal cost pricing, in which the price of water equals the cost of the last unit of developed supply, and average cost pricing, in which price equals the average cost of all supplies developed, including pre-existing supplies. Marginal cost pricing was selected for use with the Unconstrained and Environmental preference sets. All other preference sets use average cost pricing. With the assumed demand elasticity, the choice has little effect on the amount of water used.

Some stakeholder groups strongly believed that an isolated facility should be included in some preference sets. For consistency with CALFED principles and policies, the isolated facility is not considered a water supply measure in this analysis, but rather a method for improving the quality of Delta water exports. All preference sets are evaluated with no isolated facility. Sensitivity analysis is used to evaluate the cost and water supply implications of including an isolated facility in the Unconstrained and the Urban Delta Exporters preference sets.

TABLE 3-1
Summary of Stakeholder Preference Sets

Water Supply Options	Preference Sets						
	Unconstrained and No Subsidies	Environmental Groups	Urban Delta Exporters	Urban In-Delta Diverters	Delta Agriculture	Sacramento Valley Agriculture	San Joaquin Valley Agriculture
Urban Water-Use Efficiency	*Unconstrained (After implementation of BMPs)*		*Minimum and Maximum: BMPs except 632,000 acre-feet (applied water) in South Coast*	*Unconstrained (After implementation of BMPs)*	*Minimum: All urban WUE measures identified on water supply data table*	*Unconstrained (After implementation of BMPs)*	
Agricultural Water-Use Efficiency	*Unconstrained (After implementation of EWMPs)*					*Unconstrained (After implementation of EWMPs): Any real water savings reserved for local use*	
Urban Recycling	*Unconstrained*	*Minimum: The most cost-effective half of all urban recycling measures identified on water supply data table*	*Maximum: 500,000 acre-feet in South Coast* *Unconstrained: All other*	*Unconstrained*	*Minimum: All urban recycling and "other" measures identified on water supply data table*	*Unconstrained*	
Land Fallowing	*Unconstrained*		*Maximum: No land fallowing in average years. Limit land Fallowing to 400,000 acre-feet for South Coast supply in dry years*	*Unconstrained (May limit after consideration of regional impacts)*	*Maximum: None in Delta, but consider crop shifting* *Unconstrained: All other*	*Maximum: No permanent land retirement for water supply. Limit the total land fallowing for water supply in dry years to 5% of land irrigated with surface water within any region.*	*Maximum: No permanent land retirement for water supply. Limit the total land fallowing for water supply in dry years to 5% of land irrigated with surface water within any region. Transfers among SWP contractors constrained by Monterey Amendment.*
Active Conjunctive Use/Groundwater Banking	*Unconstrained*	*Unconstrained: Half of supply dedicated to environment*	*Unconstrained*			*Maximum: 250,000 acre-feet of storage in the Sacramento Valley*	*Maximum: 1,000,000 acre-feet of storage in the San Joaquin Valley*
New Surface Storage	*Unconstrained*	*Maximum: None*	*Unconstrained*	*Maximum: None in Delta on organic soils[a]* *Unconstrained: All other*		*Minimum: In Sacramento Valley, additional amount needed to make up for past losses (in Sacramento Valley first, then San Joaquin Valley)*	*Minimum: Additional amount needed to make up for past losses*
Other Supplies	Include CRA deliveries, South Delta improvements, and local projects if cost effective.				*Maximum: No South Delta improvements included unless Colorado River Aqueduct is used at capacity*		
Criteria for Cost Allocation, Water Allocation, and Pricing	*No subsidies to agricultural or urban water users. New water supply allocated based on willingness to pay. Marginal cost pricing of new water supply.*	*No subsidies to agricultural or urban water users. New water supply allocated based on willingness to pay. Marginal cost pricing of new water supply. Environmental half of conjunctive use subsidized.*	*Average cost pricing of new water supply.*	*If adverse water quality impacts found, charge beneficiaries to recover full mitigation costs. Average cost pricing of new water supply.*	*If adverse water quality impacts found, charge beneficiaries to recover full mitigation costs. Subsidize urban WUE and recycling to make competitive. Average cost pricing of new water supply.*	*Replace, at current costs, agricultural water that has been reallocated to environmental purposes. Average cost pricing of new water supply.*	
SOURCE Individuals and Organizations:		*Spreck Rosenkrans/EDF Barry Nelson/STB Ronnie Cohen/NRDC*	*Tim Blair/MWD* *B.J. Miller/SCVWD* *Byron Buck/CUWA* *Wendy Ilingworth/CUWA* *Denise Phelps/CUWA* *Peter MacLaggen/CUWA* *Andy Sienkiewich/MWD Bill Jacoby/SDCWA* *Tom Erb/LADWP*	*Byron Buck/CUWA* *Wendy Ilingworth/CUWA* *Denise Phelps/CUWA* *Peter MacLaggen/CUWA* *Fran Garland/CCWD* *Ed Formosa/Stockton* *Mark Madison/Stockton* *David Tompkins/Vacaville* *Richard Denton/CCWD* *Linda Lilley/Diablo Water David Okita/SCWA*	*Tom Zuckerman/ CDWA*	*Dan Keppen/NCWA* *Bill Curtis/NCWA* *Brice Bledsoe/CVPWA* *Jason Peltier/CVPWA*	*B.J. Miller/SLDMWA* *Laura King/SLDMWA* *Terry Erlewine/SWC* *Brice Bledsoe/CVPWA* *Jason Peltier/CVPWA* *Dan Fults/FWUA* *Cliff Schultz/KCWA* *Jon Rubin/WWD*
Comment Letters on Bulletin 160-98 or CALFED:		*Bay Institute Pacific Institute EWC STB*	*SCVWD MWD CUWA*	*CCWD SCWA*	*CDWA SDWA*	*GCID*	*SLDMWA*

[a]City of Stockton does not support this position.

Maximum = Scenario includes cost-effective options up to but not more than the amount specified.
Minimum = Scenario includes specified options even if other options are less expensive
Unconstrained = Scenario includes any cost-effective option, given willingness to pay.

CCWD = Contra County Water District
CDWA = Central Delta Water Agency
CUWA = California Urban Water Agencies
CVPWA = Central Valley Project Water Users Association
EDF = Environmental Defense Fund
EWC = Environmental Water Caucus
FWUA = Friant Water Users Association
GCID = Glenn-Colusa Irrigation District
KCWA = Kern County Water Agency
LADWP = Los Angeles Department of Water and Power
MWD = Metropolitan Water District of Southern California (Metropolitan)
NCWA = Northern California Water Association
NRDC = Natural Resources Defense Council
SCVWD = Santa Clara Valley Water District
SCWA = Sacramento County Water Agency
SDCWA = San Diego County Water Authority
SDWA = South Delta Water Agency
SLDMWA = San Luis Delta Mendota Water Authority
STB = Save the Bay
SWC = State Water Contractors
WWD =Westlands Water District

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Chapter 4

Baseline Assumptions and Methods

4. Baseline Assumptions and Methods

This chapter presents the assumptions upon which the economic evaluation was based. Common assumptions and assumptions used specifically to develop year 2020 demands and supplies for municipal and agricultural regions are described.

4.1 Common Assumptions

Some common assumptions used throughout the analysis are:

- All demands and supplies are estimated under year 2020 conditions. Municipal water demands are based on 2020 population levels, and agricultural demands are based on 2020 agricultural land-use estimates.
- A dry water supply condition is used as the basis of the analysis. The definition of the dry condition varies somewhat for different supply measures and cost and demand estimates. Generally, the analysis defines a dry year as a 1-in-5-year event or as the average condition during the period 1928 through 1934*.
- All dollar values are expressed in current dollars. The most recent cost estimates available are used, so the estimates can be viewed as representing 1998 price levels. Inflation between now and 2020 is not included in the analysis, but price increases (or reductions) resulting from changes in market conditions are included.

4.2 Demand Assumptions (Year 2020)

4.2.1 Municipal

The screening analysis uses municipal water demand functions to capture the impact of retail water price changes on water use. The demand functions were developed from information on the 2020 baseline price and quantity demanded (a point) and the elasticity of demand (the slope).

Retail quantity information for the San Francisco Bay Region was provided by DWR (1998). The quantity demanded is estimated to be 1.317 MAF. The demand quantity represents the net demand remaining after new conservation from BMPs of 0.176 MAF of applied water. The baseline price, from data for individual districts in the region, is estimated to be $691.

For the South Coast, quantity and price information were obtained from Metropolitan Water District of Southern California (Metropolitan) (1999b) and DWR (1998), respectively. Baseline price is assumed to be $625, as suggested by DWR (1998). A baseline quantity of 5.519 MAF from DWR is increased 0.151 MAF based on Metropolitan information (1999b). The quantity is increased 0.079 MAF more to account for the higher 2020 price used in the Metropolitan forecast (Metropolitan's forecast amount was based on a higher water price, so demand was increased by the lower baseline price used in this analysis). Finally, demand is increased 4 percent more to account for the net influence of drought and drought

conservation. The demand quantity represents the net demand remaining after assumed implementation of BMPs (0.134 MAF), natural replacement and remodeling (0.197 MAF), and the 1990 plumbing code (0.317 MAF), resulting in a total conservation of 0.628 MAF.

Elasticity of demand is an important technical issue in the screening process because of its role in inducing additional conservation from higher water prices. The closer the elasticity is to zero, the less conservation is induced by higher water prices. DWR presented new evidence (Renwick, et al., 1998) that suggests single-family residential demand elasticity is currently –0.16. Metropolitan (1999c) provided data for southern California showing single-family, multifamily, and non-residential demand elasticities of –0.19, -0.16, and –0.01, respectively, and suggested that elasticities in 2020 should be reduced to –0.064, -0.054, and –0.003, respectively. Demand tends to become more inelastic over time with additional conservation because of a phenomenon called demand hardening – as more water-conserving activities are implemented, water users have less flexibility to respond to future price increases. The demand baseline quantities described above already account for new conservation. Many water conservation options are assumed to be implemented in the BMPs and are no longer available to help retail users reduce their use, so demand will be less price-responsive in the future.

A working group of economists participating in the economic evaluation stakeholder meetings reviewed the new estimates and agreed that, for purposes of this evaluation, the elasticities cited above should be used. These elasticities are weighted by their share of use and summed to obtain a 2020 demand elasticity of –0.042 for all municipal use. This elasticity is used in the screening analysis with the baseline price and quantity points to calculate the demand function. A sensitivity analysis is used to assess the effect of higher demand elasticities on quantity demanded and supplies purchased. The analysis uses a constant elasticity of demand (CED) function, which is a commonly used form in empirical economic work. The CED has the mathematical form

1) $Q = AP^{Ed}$,

where

Q is the quantity demanded,
A is a coefficient,
P is price, and
Ed is the elasticity of demand.

The coefficient A is calculated from the baseline quantity, price, and elasticity by

2) $A = Q/P^{Ed}$.

The 2020 demand levels with and without new conservation, prices, and demand coefficients A are shown in Table 4-1. It should be noted that demand elasticity may actually vary from place to place, and demand may be more or less elastic depending on price, incomes, or future technology, among other factors. The CED functions assume elasticity is the same over all prices, and none of the other factors, such as increasing income over time, has been addressed.

TABLE 4-1
Demand Data and Calculations to Develop Demand Functions Used in the Screening Analysis

	San Francisco Bay Region	South Coast Region
2020 Demand Level from Bulletin 160-98, Average Condition (TAF)	1,317	5,519
Adjustments to Demand for Metropolitan (1999c, c)	0	230
Adjustment to Demand for Dry Condition (4%)	0[a]	230
Demand in 2020 (TAF)	1,317	5,979
Retail Price in 2020 ($/acre-feet)	$691	$625
Elasticity Estimate (Ed)	-0.042	-0.042
Coefficient A in $Q = AP^{Ed}$	1,733	7,835
Demand in 2020 without BMPs (TAF)	1,493	6,611
Coefficient A in $Q = AP^{Ed}$ Without BMPs (Ed = -0.125)	3,381	14,774

[a] San Francisco Bay Region demand is not increased in the dry condition, but no drought demand management is included either.

4.2.2 Agricultural

Agricultural demand for water is influenced by the mix of crops irrigated, which in turn depends on market demand for farm products. The demand for water supplies developed as part of CALFED is also crucially dependent on the availability and cost of groundwater. In most agricultural production areas in California, including the dominant Central Valley, groundwater can be used with little or no legal restriction. As a result, one of the most important determinants of demand for a new CALFED-developed water supply is the cost of groundwater pumping. Irrigation system technologies used also affect the total demand for water applied by irrigation. Reductions in non-recoverable losses from irrigation delivery reduce the total water demand. The adoption of water-saving irrigation technologies depends on their cost relative to existing technologies and relative to the value of the water saved.

4.2.2.1 Analytical Approach – Central Valley Production Model

To estimate the future agricultural demand for water, a model was used to account for all three of the important factors – crop mix, cost of groundwater, and irrigation technology. The model, called the Central Valley Production Model (CVPM), was originally developed by the DWR as a planning tool. It has been significantly enhanced with data and capabilities over the last 5 years. It has been used as the basis for the analysis of impacts of the CVPIA, Trinity River re-operation, and CALFED studies and is used to assess future crop supply responses and water use in DWR Bulletin 160.

The CVPM contains a comprehensive database of crop acreage, prices, yields, water use, and costs of Central Valley irrigated agriculture. Data are drawn from numerous sources, including the DWR, Reclamation, County Agricultural Commissioners, irrigation districts,

and the University of California (U.C.) Cooperative Extension. The model contains information on 26 crop categories and 22 regions in the Central Valley, and it accounts for water supply from CVP, the State Water Project (SWP), locally held water rights, and groundwater.

A detailed description of the CVPM is available as a technical appendix to the CVPIA Draft PEIS (Reclamation, 1997). That document describes CVPM's mathematical structure, data, calibration, model testing, and model implementation. A variation of this model, the CVPTM, is used in most of the analysis for this report. Basic crop and water supply information is identical in the two models – CVPTM adds the capability to assess water transfers from existing sources to demand regions. An 11-region version of the model is used in the analysis to estimate water demands. The 11 regions, shown in Figure 4-1, are aggregated to the 3 agricultural demand regions. For purposes of this study, regions 1 through 4 are assigned to the Sacramento River Region, regions 5 through 8 are assigned to the San Joaquin River Region, and regions 9 through 11 are assigned to the Tulare Lake Region.

4.2.2.2 Baseline 2020 Conditions Used for Analysis

To estimate the economic effects of CALFED water management alternatives, water supply and land-use conditions without CALFED are estimated. These "baseline" conditions are important, because they determine the starting point for estimating any changes resulting from CALFED water management alternatives. For example, a starting condition of greater water scarcity results in higher unit values for additional agricultural water supply. This unit value is called the "marginal willingness to pay" for additional water, or sometimes just the "marginal value (MV)," of water. The MV of water varies by location, use, and hydrologic year type.

For this analysis, we assume that the following conditions describe the baseline.

- Agricultural land use, crop demand, and water supplies are based on estimates in DWR Bulletin 160-93 unless modified by more specific assumptions or analyses. This is the current data set in the CVPM.
- CVPIA dedicated water (so-called (b)(2) water), water pricing, land retirement, and water acquisition provisions have been implemented.
- CALFED common programs have not been implemented, with the exception that CALFED's ERP is included, as explained below. The ERP includes a potentially large amount of water and land acquisition for environmental restoration.

The combination of CVPIA and CALFED land and water acquisition could have a large cumulative effect on agricultural water use and on the MV of agricultural water supply. At the time future water demands were being estimated for this analysis, no comprehensive hydrologic analysis had been completed that estimated the impacts of CVPIA and CALFED's ERP.

To represent the combined effects of these two programs, CVPIA Alternative 4 conditions are used as a proxy. Alternative 4 included the largest amount of water acquisition and reduction of agricultural water deliveries of the four alternatives assessed in the Draft PEIS (Reclamation, 1997). Therefore, of the comprehensive hydrologic analyses available at the

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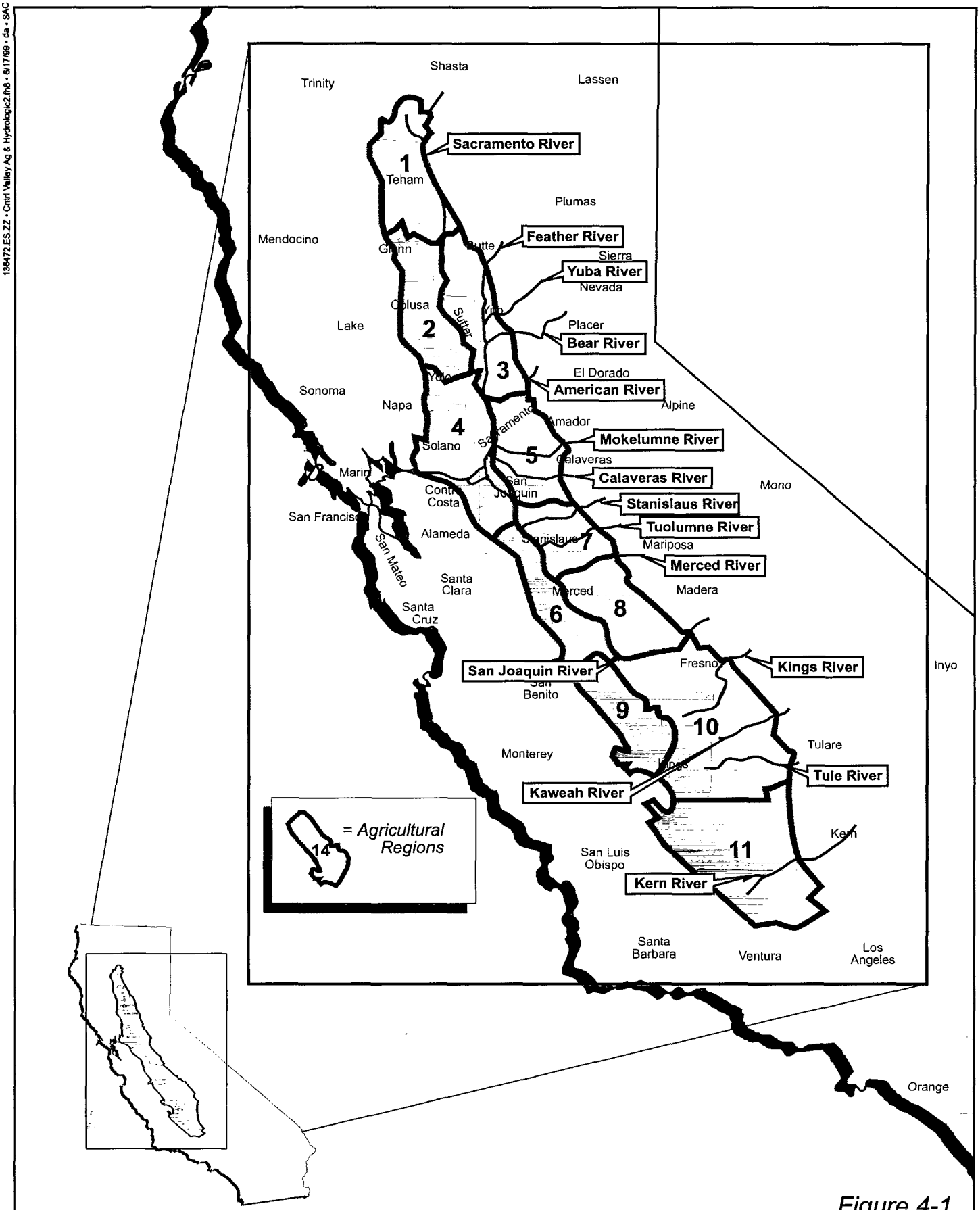

Figure 4-1

Central Valley Agricultural Production and Transfer Model Regions Used to Estimate Agricultural Water Demands

time, this alternative appeared to represent most closely the future conditions with both CVPIA and CALFED ERP implementation. Relative to the estimates in Bulletin 160-93, important differences are:

- The retirement of 75,000 acres of land on the western side of the San Joaquin Valley.
- The reduction in CVP water delivery (measured here as a change in applied irrigation water) of 364,000 acre-feet on average and 377,000 in the dry condition.
- The acquisition of up to 800,000 acre-feet of additional water for instream flow and Delta outflow, primarily from the San Joaquin River tributaries. As a result of operational constraints, an average of about 710,000 acre-feet was estimated to be acquired.

The net result of using Alternative 4 as a baseline condition is that the MV of water for irrigation is higher than under existing conditions, especially in the San Joaquin River and Tulare Lake Regions.

4.2.2.3 Use of CVPTM to Derive Agricultural Water Demands

Agricultural water demands are estimated for the Sacramento River Region, San Joaquin River Region, and Tulare Lake Region. Water demand is estimated by changing surface water supply from the baseline in small, fixed amounts. This is done in each of the model regions, using CVPTM to estimate the MV of irrigation water at each step. The results are compiled and used to trace a relationship between changes in applied irrigation water and changes in the MV of irrigation water. Water demand elasticities are estimated for each agricultural region by dividing the percentage of change in applied water by the percentage of change in the MV of water. This is done for each increment of applied water increase relative to the base level. Elasticities estimated in this way are called arc elasticities. The results of this analysis are shown in Table 4-2. Based on this analysis, the following elasticities of demand for irrigation water supply are used in the screening analysis: -0.18 for the Sacramento River Region; -0.28 for the San Joaquin River Region; and –0.24 for the Tulare Lake Region.

TABLE 4-2
Results of Parametric Estimation of Agricultural Water Demand Elasticities

Regions	Increments of Increase in Applied Irrigation Water				
Sacramento River					
Change in Applied Water (%)	0	2.0	3.9	5.2	5.5
Marginal Value of Water ($/AF)	57.0	50.6	44.5	39.8	38.5
Arc Elasticity of Demand		-0.18	-0.18	-0.17	-0.17
San Joaquin River					
Change in Applied Water (%)	0.0	2.0	4.0	6.0	8.0
Marginal Value of Water ($/AF)	147.7	136.3	126.6	116.9	107.3
Arc Elasticity of Demand		-0.26	-0.28	-0.29	-0.29
Tulare Lake					
Change in Applied Water (%)	0.0	2.0	4.0	6.0	8.0
Marginal Value of Water ($/AF)	151.3	138.5	125.7	113.4	101.1
Arc Elasticity of Demand		-0.24	-0.24	-0.24	-0.24

The elasticities are used, along with the estimates of the 2020 baseline quantity and price, to create regional demand functions for irrigation water. The functional form and procedure are the same as described for the municipal demands. Table 4-3 summarizes the baseline applied water, MV, elasticity, and agricultural demand function coefficient for each agricultural region.

TABLE 4-3
Data and Calculations to Develop Agricultural Demand Functions Used in the Screening Analysis

	Sacramento River Region	San Joaquin River Region	Tulare Lake Region
2020 Applied Water Estimate, CVPIA Alternative 4, Dry Condition (in 1,000 acre-feet)	7,182	4,518	8,547
Marginal Value of Irrigation Water in 2020 ($/AF)	57	148	151
Elasticity Estimate (Ed)	-0.18	-0.28	-0.24
Coefficient A in Q = AP (Ed)	14,870	18,307	28,495

4.3 Supply Assumptions (Year 2020)

4.3.1 Municipal

Baseline supply levels include all existing supplies and new supplies currently planned to be in place by 2020. Baseline supplies include SWP and CVP supplies, existing local supplies, including reclamation and groundwater, and local surface storage. Most baseline supply amounts are from data provided by DWR (1998), except that SWP and CVP export supplies are based on DWRSIM run 675. At the time of this study, CALFED used DWRSIM run 675 as its hydrologic baseline. Therefore, the DWRSIM Run 514 supplies used in Bulletin 160-98 are replaced with the amount of supplies from DWRSIM run 675.

DWR does not differentiate regional supplies in terms of type of use, so the share of supplies available for municipal use must be estimated. In both municipal demand regions it is assumed that all environmental and agricultural demands will be met. Therefore, these demands are subtracted from total 2020 supplies to obtain baseline supplies remaining for municipal and industrial (M&I) use. Finally, any M&I supplies treated by membrane technology are reduced in the 2020 condition by 10 percent to account for brine loss (see Chapter 6).

Table 4-4 shows the calculation of baseline supplies for the two municipal regions.

4.3.2 Agricultural

Water supply and agricultural land-use assumptions were described in the discussion of agricultural water demands. The important assumptions about 2020 baseline water supply result from the decision to use CVPIA Alternative 4 as the baseline. The rationale, as described earlier, is to represent as well as possible the level of water reallocation and acquisition that can result from both CVPIA and CALFED implementation. Because quantitative estimates of CALFED water acquisition impacts had not been completed in time for this analysis, CVPIA Alternative 4 is used to approximate the baseline condition

with CALFED. Water supplies estimated for the baseline condition are shown by agricultural region in Table 4-5. Quantities shown in the table represent applied irrigation water rather than diversions from streams and canals; therefore, the numbers already account for reuse and delivery losses.

TABLE 4-4
Calculations to Obtain Baseline Supply Levels in Municipal Regions (TAF)

	San Francisco Bay Region	South Coast Region
Bulletin 160-98 local supplies	5,543	4,865
Local Surface Water	270	140
Local Groundwater	84	1,380
Reuse/Recycled Water	3,059	727
Imports/Federal	1.006	2,563
Required Instream Flow	1,124	55
DWRSIM Run 514 SWP/CVP	-436	-1,354
DWRSIM Run 675 SWP/CVP	+403	+1,226
Environmental Demands (160-98)	-4,294	-86
Agricultural Demands (160-98)	-108	-484
Brine Loss from MT, with Isolated Facility	-15	0
Baseline Supplies, with Isolated Facility	1,093	4,167
Brine Loss from MT, without Isolated Facility	-30	-80
Baseline Supplies, without Isolated Facility	1,078	4,087

MT = membrane technology

TABLE 4-5
Average and Dry Conditions for Applied Irrigation Water by Central Valley Region (TAF)

Region	Surface Water	Groundwater	Total Applied
Average Condition (1922-90)			
Sacramento River	4,710	2,445	7,155
San Joaquin River	2,110	2,410	4,520
Tulare Lake	3,800	4,760	8,560
Total Central Valley	**10,620**	**9,615**	**20,235**
Dry Condition (1928-34)			
Sacramento River	4,370	3,060	7,430
San Joaquin River	1,955	2,885	4,840
Tulare Lake	2,510	6,365	8,875
Total Central Valley	**8,835**	**12,310**	**21,145**

Source: CVPIA Draft PEIS (Reclamation, 1997).

Chapter 5

New Supply Data

5. New Supply Data

The following categories of water option types were identified by reviewing existing information and reports provided by water supply agencies:

- Urban WUE
- Agricultural WUE
- Urban Recycling
- Land Fallowing
- Active Conjunctive Use
- Surface Storage
- Other (primarily South Delta improvements and local projects)

For each category, many individual measures have been identified and characterized relative to their cost and quantity of supply, as shown in Table 5-1. Quantities are shown for both average- and dry-year supplies. Dry years are defined as approximately the driest 20 percent of all years. Dry-year quantities of some supply measures are estimated as the average supply that could have been provided during the 1928 through 1934 drought.

5.1 Urban Water-Use Efficiency

Urban WUE actions available as supply measures are those actions above and beyond BMPs and other-water saving plans already planned for implementation by 2020. They include further reductions in distribution system losses, indoor domestic and industrial water use, and outdoor water use. The quantities and costs are based on DWR (1998) and CALFED (1999a) information and on input from Metropolitan.

Metropolitan has refined BMP estimates made by DWR to include other conservation actions planned for implementation by 2020. These refined estimates are used for the South Coast Region. CALFED has identified urban WUE actions beyond those identified by DWR. These additional actions involve reducing indoor commercial, industrial and institutional (CII) use by up to 11 percent. The cost for these additional actions is estimated by extrapolating from the DWR cost estimates.

BMPs and other actions planned for implementation by 2020 include 628 TAF per year in the South Coast Region and 176 TAF per year in the San Francisco Bay Region. Additional actions considered as supply options total 680 TAF per year in the South Coast Region and 175 TAF per year in the San Francisco Bay Region. Costs at source range from $300 to $1650 per acre-foot.

5.2 Agricultural Water-Use Efficiency

Agricultural WUE measures available as supply options are those actions above and beyond EWMPs already planned for implementation by 2020. EWMPs implemented in the Colorado River Region are the exception; water savings from EWMPs in the Colorado River Region

are available to be transferred as a new water supply. Additional WUE actions include increases in farm efficiency, tailwater recovery, flexible water delivery, and canal lining and piping. All quantities represent reductions in consumptive use or unrecoverable losses. The quantities and costs are based on DWR (1998) and CALFED (1999a).

CALFED has identified agricultural WUE actions in addition to those identified by DWR. These additional actions involve further increases in farm efficiency and are identified as "Increase efficiency, Range 4." The cost for these additional actions is estimated by extrapolating from the DWR cost estimates.

A total of 577 TAF of agricultural WUE is identified as available for new water supply, with annual costs ranging from $100 to $1200 per acre-foot.

5.3 Urban Recycling

Urban recycling measures are expressed as "ranges" that represent progressively increased costs of implementation. Quantities available from recycling, up to a cost of $1,500 per acre-foot, are identified. Costs and quantities are based on information provided by DWR (1998), CALFED (1999a), and Metropolitan and other local agencies.

CALFED has identified urban recycling actions in addition to those identified by DWR and the local agencies. These additional measures are identified as "Range 5" for the South Coast Region and "Range 4" for the San Francisco Bay Region. The cost for these additional measures is estimated by extrapolating from the DWR cost estimates.

A total of 1020 TAF of urban recycling water is identified as available for new water supply, with annual costs ranging from $500 to $1500 per acre-foot.

5.4 Land Fallowing

Land fallowing is included here as a potential source of water for transfer from an agricultural region to an urban demand region or another agricultural region. Costs and available quantities of water from land fallowing vary by location and time. Key components of the cost at source include:

- The MV of water in agricultural use, defined as the net income a farmer can generate by using another increment of water in irrigated crop production
- Additional incentive above the MV needed to induce a sale and compensate the farmer for the costs and inconvenience of changing operations
- Potential compensation paid for third-party impacts to water users, local governments, and others

Additional permitting, transactions, and transport costs are not included in the cost at the source, though they are included in the total net cost to the buyer.

D-013443

TABLE 5-1
Supply Data at Source
(Supply data used for EEWMA scenario development. All costs are costs at the source, unless otherwise noted, and do not include transfer costs.)

Option			Average Quantity (TAF/year)	Average Cost ($/AF)	Dry Quantity (TAF/year)	Dry Cost ($/AF)	Notes
Type	Location	Measure					
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	84	$300	a, i, o
Urban WUE	South Coast	Reduce indoor water use to 60 gallons per capita per day (gpcd)	110	$400	110	$400	a, i, o
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	30	$500	a, i, o
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	110	$800	a, i, o
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new development	67	$750	67	$750	a, i, o
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	19	$1,125	a, i, o
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	81	$2,000	a, i, o
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, existing development	179	$1,650	179	$1,650	g, i, o
Urban WUE	South Coast	BMPs and other conservation savings	? (628)	?	? (628)	?	c, i, o
Urban WUE	San Francisco Bay	Reduce distribution system losses to 5%	13	$300	13	$300	a, i, o
Urban WUE	San Francisco Bay	Reduce indoor water use to 60 gpcd	38	$400	38	$400	a, i, o
Urban WUE	San Francisco Bay	Reduce indoor CII use by 3%	11	$500	11	$500	a, i, o
Urban WUE	San Francisco Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	39	$800	a, i, o
Urban WUE	San Francisco Bay	Reduce outdoor use to 0.8 ET, new development	2	$750	2	$750	a, i, o
Urban WUE	San Francisco Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	7	$1,125	a, i, o
Urban WUE	San Francisco Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	28	$2,000	a, i, o
Urban WUE	San Francisco Bay	Reduce outdoor use to 0.8 ET, existing development	50	$1,650	50	$1,650	a, i, o
Urban WUE	San Francisco Bay	BMPs	172 (176)	?	172 (176)	?	a, i, o
Ag WUE	San Joaquin	EWMPs	6 (148)	?	6 (148)	?	a, g, i, o
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	7	$1,500	g, i
Ag WUE	Sacramento	EWMPs	12 (203)	?	12 (203)	?	a, g, i, o
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	15	$1,500	g, i
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	7	$100	a, i
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	5	$475	a, i
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	5	$950	a, i
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	44	$1,500	g, i
Ag WUE	Tulare	EWMPs	33 (45)	?	33 (45)	?	a, g, i, o
Ag WUE	Colorado River	Increase efficiency, Range 1	22	$100	22	$100	a, i,q
Ag WUE	Colorado River	Increase efficiency, Range 2	14	$475	14	$475	a, i,q
Ag WUE	Colorado River	Increase efficiency, Range 3	14	$950	14	$950	a, i,q
Ag WUE	Colorado River	Increase efficiency, Range 4	75	$1,500	75	$1,500	g, i,q
Ag WUE	Colorado River	Tailwater recovery	65	$150	65	$150	a, i,q
Ag WUE	Colorado River	Flexible water delivery	30	$1,000	30	$1,000	a, i,q
Ag WUE	Colorado River	Canal lining and piping	45	$1,200	45	$1,200	a, i,q
Ag WUE	Colorado River	EWMPs	210 (249)	?	210 (249)	?	a, i,q
Urban Recycling	South Coast	Range 1	100	$500	100	$500	c, o
Urban Recycling	South Coast	Range 2	100	$750	100	$750	c, o
Urban Recycling	South Coast	Range 3	100	$1,100	100	$1,100	c, o
Urban Recycling	South Coast	Range 4	100	$1,500	100	$1,500	c, o
Urban Recycling	South Coast	Range 5	435	$1,500	435	$1,500	g, o
Urban Recycling	San Francisco Bay	Range 1	25	$500	25	$500	d, o

D—013443

TABLE 5-1
Supply Data at Source
(Supply data used for EEWMA scenario development. All costs are costs at the source, unless otherwise noted, and do not include transfer costs.)

Type	Location	Option: Measure	Average Quantity (TAF/year)	Average Cost ($/AF)	Dry Quantity (TAF/year)	Dry Cost ($/AF)	Notes
Urban Recycling	San Francisco Bay	Range 2	25	$750	25	$750	d, o
Urban Recycling	San Francisco Bay	Range 3	50	$1,100	50	$1,100	d, o
Urban Recycling	San Francisco Bay	Range 4	85	$1,500	85	$1,500	g, o
Land Fallowing	Sacramento	Environmental Purchase	210	$102	114	$160	m, e, p
Land Fallowing	Sacramento	Range 1	25	$139	10	$185	b, e
Land Fallowing	Sacramento	Range 2	10	$143	28	$187	b, e
Land Fallowing	Sacramento	Range 3	32	$150	32	$188	b, e
Land Fallowing	Sacramento	Range 4	27	$155	28	$205	b, e
Land Fallowing	Sacramento	Range 5	10	$160	32	$209	b, e
Land Fallowing	Sacramento	Range 6	25	$164	25	$215	b, e
Land Fallowing	Sacramento	Range 7	32	$172	28	$228	b, e
Land Fallowing	Sacramento	Range 8	27	$173	32	$232	b, e
Land Fallowing	Sacramento	Range 9	10	$176	10	$248	b, e
Land Fallowing	Sacramento	Range 10	25	$189	25	$248	b, e
Land Fallowing	Sacramento	Range 11	27	$192	28	$252	b, e
Land Fallowing	Sacramento	Range 12	10	$193	32	$256	b, e
Land Fallowing	Sacramento	Range 13	32	$195	28	$275	b, e
Land Fallowing	Sacramento	Range 14	10	$209	32	$279	b, e
Land Fallowing	Sacramento	Range 15	27	$211	25	$283	b, e
Land Fallowing	Sacramento	Range 16	25	$214	25	$317	b, e
Land Fallowing	Sacramento	Range 17	32	$217	10	$355	b, e
Land Fallowing	Sacramento	Range 18	27	$229	25	$362	b, e
Land Fallowing	Sacramento	Range 19	25	$239	10	$510	b, e
Land Fallowing	Sacramento	Range 20	32	$239	10	$666	b, e
Land Fallowing	San Joaquin	Environmental Purchase	?	?	533	$210	m, e, p
Land Fallowing	San Joaquin	Range 1	12	$192	12	$224	b, e
Land Fallowing	San Joaquin	Range 2	12	$208	12	$279	b, e
Land Fallowing	San Joaquin	Range 3	16	$208	12	$336	b, e
Land Fallowing	San Joaquin	Range 4	12	$223	12	$406	b, e
Land Fallowing	San Joaquin	Range 5	12	$239	21	$452	b, e
Land Fallowing	San Joaquin	Range 6	16	$239	12	$483	b, e
Land Fallowing	San Joaquin	Range 7	12	$255	21	$522	b, e
Land Fallowing	San Joaquin	Range 8	16	$269	21	$590	b, e
Land Fallowing	San Joaquin	Range 9	16	$301	21	$659	b, e
Land Fallowing	San Joaquin	Range 10	21	$317	13	$694	b, e
Land Fallowing	San Joaquin	Range 11	16	$332	21	$728	b, e
Land Fallowing	San Joaquin	Range 12	21	$350	13	$734	b, e
Land Fallowing	San Joaquin	Range 13	21	$380	13	$775	b, e
Land Fallowing	San Joaquin	Range 14	14	$411	13	$815	b, e
Land Fallowing	San Joaquin	Range 15	21	$412	13	$856	b, e
Land Fallowing	San Joaquin	Range 16	14	$436	0	--	b, e

D-013444

D—013444

D-013445

TABLE 5-1
Supply Data at Source
(Supply data used for EEWMA scenario development. All costs are costs at the source, unless otherwise noted, and do not include transfer costs.)

Option			Average Quantity (TAF/year)	Average Cost ($/AF)	Dry Quantity (TAF/year)	Dry Cost ($/AF)	Notes
Type	Location	Measure					
Land Fallowing	San Joaquin	Range 17	21	$443	0	--	b, e
Land Fallowing	San Joaquin	Range 18	14	$462	0	--	b, e
Land Fallowing	San Joaquin	Range 19	14	$487	0	--	b, e
Land Fallowing	San Joaquin	Range 20	14	$511	0	--	b, e
Land Fallowing	Tulare	Environmental Purchase	?	?	82	$194	m, o, p
Land Fallowing	Tulare	Range 1	70	$195	67	$387	b, e
Land Fallowing	Tulare	Range 2	70	$232	67	$438	b, e
Land Fallowing	Tulare	Range 3	70	$269	67	$490	b, e
Land Fallowing	Tulare	Range 4	70	$307	36	$492	b, e
Land Fallowing	Tulare	Range 5	37	$321	36	$540	b, e
Land Fallowing	Tulare	Range 6	70	$343	67	$542	b, e
Land Fallowing	Tulare	Range 7	37	$360	36	$588	b, e
Land Fallowing	Tulare	Range 8	37	$398	67	$594	b, e
Land Fallowing	Tulare	Range 9	37	$436	19	$607	b, e
Land Fallowing	Tulare	Range 10	20	$438	36	$635	b, e
Land Fallowing	Tulare	Range 11	37	$474	19	$648	b, e
Land Fallowing	Tulare	Range 12	20	$480	36	$683	b, e
Land Fallowing	Tulare	Range 13	20	$523	19	$688	b, e
Land Fallowing	Tulare	Range 14	20	$566	19	$730	b, e
Land Fallowing	Tulare	Range 15	20	$608	19	$771	b, e
Active Conjunctive Use	Sacramento	Project 1	?	?	60	$150	f, k, n
Active Conjunctive Use	Sacramento	Project 2	?	?	60	$200	f, k, n
Active Conjunctive Use	Sacramento	Project 3	?	?	60	$250	f, k, n
Active Conjunctive Use	Sacramento	Project 4	?	?	60	$300	f, k, n
Active Conjunctive Use	San Joaquin	Project 1	?	?	40	$150	f, k, n
Active Conjunctive Use	San Joaquin	Project 2	?	?	40	$200	f, k, n
Active Conjunctive Use	San Joaquin	Project 3	?	?	40	$250	f, k, n
Active Conjunctive Use	San Joaquin	Project 4	?	?	40	$300	f, k, n
Active Conjunctive Use	Tulare	Kern Water Bank	?	?	300	$150	f, k, n, o
Active Conjunctive Use	Tulare	Project 1	?	?	100	$250	f, k, n
Surface Storage	Sacramento	Sacramento River onstream high yield estimate	80	$162	50	$162	g, l, h, j
Surface Storage	Sacramento	Sacramento River onstream low yield estimate	50	$260	30	$260	g, l, h, j
Surface Storage	Sacramento	Sacramento River offstream high yield estimate	450	$246	450	$246	g, h, j
Surface Storage	Sacramento	Sacramento River offstream low yield estimate	290	$382	290	$382	g, h, j
Surface Storage	San Joaquin	San Joaquin River onstream high yield estimate	90	$1,333	0	--	g, h, j
Surface Storage	San Joaquin	San Joaquin River onstream low yield estimate	50	$2,400	0	--	g, h, j
Surface Storage	San Joaquin	San Joaquin River offstream high yield estimate	110	$232	9	$232	g, h, j
Surface Storage	San Joaquin	San Joaquin River offstream low yield estimate	55	$464	5	$464	g, h, j
Surface Storage	San Joaquin	Aqueduct offstream high yield estimate	210	$876	310	$876	g, h, j
Surface Storage	San Joaquin	Aqueduct offstream low yield estimate	180	$1,022	170	$1,022	g, h, j

D—013445

D-013446

TABLE 5-1
Supply Data at Source
(Supply data used for EEWMA scenario development. All costs are costs at the source, unless otherwise noted, and do not include transfer costs.)

Option			Average Quantity (TAF/year)	Average Cost ($/AF)	Dry Quantity (TAF/year)	Dry Cost ($/AF)	Notes
Type	Location	Measure					
Other	Delta	South Delta Improvements	260	$110	65	$110	g
Other	South Coast	Local Groundwater Desalination Range 1	27	$500	27	$500	a, o
Other	South Coast	Local Groundwater Desalination Range 2	330	$1,000	330	$1,000	a, o
Other	South Coast	Local Agriculture WUE Range 1	7	$250	7	$250	a, o
Other	South Coast	Local Agriculture WUE Range 2	10	$450	10	$450	a, o
Other	South Coast	Local Agriculture WUE Range 3	19	$1,500	19	$1,500	g, i, o
Other	South Coast	Local Conjunctive use	0	--	130	$350	a, o
Other	San Francisco Bay	Surface storage	20	$600	10	$600	a, o
Other	San Francisco Bay	Conjunctive use	0	--	2	$150	a, o
Other	San Francisco Bay	American River	112	$850	70	$850	a, o
Other	Colorado River	Intrastate groundwater banking	0	--	100	$230	a
Other	Colorado River	Interstate groundwater banking	0	--	50	$230	a
Other	Colorado River	Future land fallowing agreements	0	--	100	$230	a
Other	Colorado River	All American Canal lining	68	$230	68	$230	a
Other	Colorado River	Coachella Canal lining	26	$230	26	$230	a

Notes:
[a] based on data developed by dwr.
[b] includes 100% cost additive for market effects.
[c] based on information provided by metropolitan.
[d] based on bay area water supply plans/irps.
[e] based on cvptm output. quantities are reduction in evapotranspiration.
[f] based on data developed by dwr, reclamation, and natural heritage institute.
[g] based on data developed by calfed.
[h] high and low yield estimate rows indicate a range of yield from the same project.
[i] urban and agricultural wue quantities represent depletion amounts. (quantities in parentheses represent applied water.)
[j] losses across the delta are included in these quantity and price estimates.
[k] storage capacity is assumed to be dry quantity x 5.
[l] based on modeling analysis by reclamation.
[m] based on reclamation cvpia analysis. not available for urban and agricultural water supply.
[n] these projects are assumed to be operated for dry-year supply.
[o] supply used locally.
[p] from willing sellers.
[q] these measures can contribute to filling the Colorado River Aqueduct (CRA) to its capacity.

-- means not applicable

? means no analysis available for cost estimation

gpcd = gallons per capita per day
EI = Export/Import

D—013446

The MV and quantity of water available from land fallowing were estimated using the CVPTM, as described in the PEIS for CVPIA (Reclamation, 1997). CVPTM simulates decisions that Central Valley farmers make to maximize profits subject to resource, technical, and market constraints. CVPTM was used to estimate the MV of water used for irrigated crop production and, hence, the minimum price that agriculture will accept to sell different amounts of water available from land fallowing. CVPTM was used to estimate the MV per acre-foot of applied water. These estimates, and all water quantity estimates, are converted to equivalent values of consumptive use in the analysis.

Some market incentive payment above the MV of water will be necessary to induce existing users to sell water. The incentive payment would provide profit and compensation for costs of implementing associated changes in farm and water operations. The magnitude of the needed incentive payment is uncertain and varies for different circumstances. Based on discussions with representatives from potential urban buyers and potential agricultural sellers, and considering the experience of the 1991 Drought Water Bank, the market incentive payment (the percentage by which the price paid must exceed the MV of water to induce land fallowing and the sale of the water) was estimated to be 100 percent. There was not full agreement on the appropriate size of incentive; some believed that 100 percent was too high. This remains an item of uncertainty in the analysis. A sensitivity analysis is conducted to assess the effect of lower incentive payments. Agricultural preference sets restrict land fallowing, reflecting the belief that the option is not practical or desirable, regardless of the size of payment.

Additional compensatory costs for third-party economic impact claims are not explicitly included (although they could be considered part of the 100 percent incentive payment). Much uncertainty remains about the legal status of claims of impact and how such claims will be verified and paid (Appendix B describes a regional economic impact model used to estimate the scale of economic impacts for candidate land fallowing options being assessed).

Land fallowing options are assessed for several regions in the Central Valley to capture regional variation. Costs and quantities are divided into ranges that show the increasing cost of water as more land is fallowed. Costs at source range from approximately $200 per acre-foot to as high as $800 per acre-foot. Implementation details are not specified for this study. Land fallowing programs can be implemented as fee title purchase of land, long-term leases, option agreements, short-term rotational leases, or annual agreements. Costs of water generated may differ depending on the implementation approach. For example, fee title purchase allows the seller to avoid all costs associated with the land, including taxes, management, maintenance, etc., and this may create a lower front-end cost. However, the buyer must then absorb those annual costs, so the total cost of a fee title purchase may not be lower.

Costs of land fallowing options are strongly influenced by the baseline assumptions described in Chapter 4. The Bay-Delta Accord and CVPIA dedicated water are assumed as part of the baseline. These have been estimated to reduce agricultural water supply by about 1 million acre-feet in a dry condition (CALFED, 1998a). An additional 710 TAF of water is assumed to be acquired for instream flow and other environmental purposes, at a cost of $142 million per year. These programs effectively compete for water with land fallowing options, raising the cost of water.

Costs can be substantially lower for water sold to other farmers within a region. Transfers of water within a basin, and especially within a district, are common. Transaction costs, transport costs, and incentive payments tend to be lower for such transfers. Because transfers of water within a basin or district are presumed to occur with or without CALFED, they are not treated as new supplies and therefore are not evaluated or included in this analysis.

Crop shifting is an idea related to land fallowing that is also considered. Under this concept, agriculture could shift water and land out of low revenue, high water-using crops into high revenue crops, thereby making more money with less water. However, farmers generally look for opportunities to produce high revenue crops simply to earn profit. Market factors such as demand elasticity and available processing and marketing contracts restrict farmers from increasing the high revenue crops faster than the growth in demand will support. In other words, if crop shifting were profitable and feasible (considering soil suitability, knowledge, and risk), farmers would have done it already.

However, when land is voluntarily fallowed to sell water, an effective crop shift from low to high revenue crops usually occurs. Crops fallowed are predominantly forage and other field crops, not vegetables, orchards, and vines. Therefore a change in crop mix is achieved without an absolute increase in production of high revenue crops.

5.5 Active Conjunctive Use

Active conjunctive use (or groundwater banking) involves the active storage of surface water in the ground and its subsequent retrieval. Active conjunctive-use actions are expressed in terms of generic "projects" representing progressively increased costs of implementation. Costs and quantities are based on information provided by Reclamation (1995) and the Natural Heritage Institute (NHI) (1998). Cost estimates include all costs of storage and extraction, assuming the projects are actively operated for regional water supply (and are not so-called "in-lieu" conjunctive use projects). It is recognized that this information is very uncertain, and that additional investigation is required to develop more reliable cost and quantity estimates. Reclamation has identified more than 2,435 TAF of conjunctive use storage capacity in the Central Valley. Approximately 1,200 TAF of this storage is in the Sacramento River Region, 800 TAF is in the San Joaquin River Region, and 500 TAF is in the Tulare Lake Region (excluding the Kern Water Bank).

Potential dry-year active conjunctive-use supply for each region in this evaluation is estimated by dividing these storage capacities by five. Total dry-year supplies for each region are therefore 240 TAF, 160 TAF, and 100 TAF, respectively. The Sacramento River Region active conjunctive-use supply is further divided into four projects, each with a supply of 60 TAF. The San Joaquin River Region active conjunctive-use supply is also divided into four projects, but with a supply from each of 40 TAF. The active conjunctive-use supply from the Tulare Lake Region is retained as one project with a supply of 100 TAF. The Kern Water Bank provides an additional supply of 300 TAF, which is assumed to be available only for local use.

NHI has summarized the costs of groundwater banking projects in California. These costs range from $10 to $337 per acre-foot. This cost range is captured by assigning costs to the

D-013448

active conjunctive-use projects in the Sacramento and San Joaquin River Regions that range from $150 to $300 per acre-foot. The Tulare Lake Region project is assigned a cost of $250 per acre-foot.

The practicality and implementability of conjunctive use projects remain uncertain. A sensitivity analysis is included that eliminates conjunctive use as an option.

5.6 Surface Storage

Surface storage projects are identified as onstream and offstream storage projects associated with the Sacramento and San Joaquin rivers and an offstream storage project associated with the California Aqueduct. The generic project names are associated with specific projects for which CALFED has estimated cost and supply quantities (CALFED 1998b).

Sacramento River onstream	290 TAF Shasta Lake enlargement
Sacramento River offstream	2000 TAF Sites Reservoir
San Joaquin River onstream	720 TAF Millerton Lake enlargement
San Joaquin River offstream	240 TAF Montgomery Reservoir
California Aqueduct offstream	1065 TAF Los Vaqueros enlargement

CALFED's cost and supply evaluations were based on DWRSIM (study 703) results, with each of the example facilities operated to meet full SWP and CVP entitlements. Deliveries to both urban and agricultural users were made without regard to cost or willingness to pay. Surplus flows (flow in excess of minimum instream flow and not needed for water quality control) were assumed to be captured and stored by the facility, and exports pumped at either Banks or Tracy pumping plant.

Each project has a high-yield and a low-yield estimate. The high-yield estimate is based on operations studies that have been conducted by CALFED. The low-yield estimate is one-half the high-yield estimate. The supply quantities associated with high-yield estimates are used for scenario development. These quantities represent supply south of the Delta and, therefore, are not subject to an additional Delta loss.

Costs are determined by dividing the annualized cost of a measure by the measure's average supply over all years. It should be noted that this procedure essentially assumes that water from supply measures that have a non-dry year supply will be purchased during those non-dry years. If they are not purchased, the average amount of use is less, and the average cost per unit actually used is more.

A total of 1214 TAF of new dry-year supply from surface storage is identified, with costs ranging from approximately $150 to $1000 per acre-foot.

5.7 Other

Other water supply projects include those that have been identified but that do not fit conveniently into the categories already described. Most of the other supplies are DWR's local projects and a variety of water storage and management options within the demand regions.

The cost and supply from South Delta improvements have been estimated by CALFED. The costs and supplies of the remaining measures have been estimated by DWR. Approximately 1000 TAF of new supplies are included in this category, with costs ranging from $110 to $1500 per acre-foot.

Chapter 6

Scenario Implementation

6. Scenario Implementation

This section explains how the supply data from Section 5 are used with the demand data from Chapter 4 to develop a demand and supply analysis. First, retail water pricing is discussed, and methods of calculating retail price based on water costs are shown. Then, issues involving the allocation of water supplies among competing demand regions are discussed. Finally, the process for adjusting the water supply cost and quantity data in Chapter 5 is shown. This converts cost and quantity at the source to a net cost and quantity at the destination, and accounts for water quality, transport costs and losses, reapplication, and a variety of incidental costs and benefits. These adjustments are documented, and the mechanisms whereby preference sets affect the selection of supplies are discussed.

6.1 Methods

The stakeholder preference sets are analyzed for each of five water demand regions in California. The Sacramento River Region, the San Joaquin River Region, and the Tulare Lake Region include agricultural demands and supplies; the San Francisco Bay Region and the South Coast Region include urban water demand and supply. Seven scenarios are analyzed, including six based on stakeholder preference sets and one Unconstrained scenario. In addition, four sensitivity analyses are conducted, all based on the Unconstrained scenario. Six stakeholder preference sets, plus the Unconstrained scenario and four sensitivity analyses, are analyzed for each of the five demand regions, bringing the total number of screening analyses to 55.

The analysis represents 2020 water demand and supply conditions in each demand region. The conventional graphical device of economic demand and supply functions is used. Demand and supply are both expressed in terms of quantity and unit price or cost. Supply is expressed as unit cost or average cost, and these values are compared to demand on the graph. The intersection of supply and demand indicates which supply measures the demand region would be willing to pay for. The supply measures to the left of this intersection are the ones that could be developed or implemented by 2020.

6.2 Retail Water Pricing

Stakeholder groups identified the relationship between urban water cost and retail price as an important technical issue. Each group also stated a preference for the method water supply agencies should use to set retail water price. (The two pricing methods selected by stakeholders are marginal cost pricing and average cost pricing.) The technical issue involved how to calculate 2020 retail prices, given the costs of new supplies and the selected pricing method.

In concept, marginal cost pricing requires that the retail price of water equal the unit cost of the last unit of water provided, where unit cost includes any variable costs of providing that last unit. Marginal cost pricing provides incentive for economically efficient water use, but

does not normally provide revenues equal to costs. If there are large fixed costs that are not part of the unit cost, price is less than average cost, and revenues are less than total costs. Water supply agencies often use non-price financing mechanisms, such as service charges, capacity charges, or taxes, to recover fixed costs. If, on the other hand, the marginal cost is more than average cost, revenues can exceed costs. Most public agencies are prevented by law from earning a profit.

Average cost pricing can, by definition, recover all costs. Average cost pricing does not result in economically efficient water use, because water users do not pay the cost of the last unit of water delivered. If water costs are rising with the amount of water supplied, then average cost pricing subsidizes new users at the expense of existing users. Marginal cost pricing, which involves no subsidies, is selected as an attribute of the Unconstrained preference set.

A large difference often exists between the cost of raw water supplies and retail price. Costs for treatment, distribution, and administrative overhead are recovered using the retail price of water. Therefore, estimating the appropriate retail price under future conditions was a significant technical issue. It was decided to use the existing dollar cost additive, above current raw water cost, for the 2020 average and marginal cost pricing methods. The existing average and marginal raw water costs were estimated, and the difference between these costs and retail price was calculated, as shown in Table 6-1 below.

TABLE 6-1
Calculation of Cost Recovery Additive Used to Obtain Retail Price[a]

	San Francisco Bay Region	South Coast Region
1. Existing Average Price	$691	$625
2. Existing Average Cost	$171	$125
3. Average Cost Additive (1-2)	$520	$500
4. Existing Marginal Cost	$209	$300
5. Marginal Cost Additive (1-4)	$482	$325

[a] These values are added to the unit cost of water at the treatment plant.

These cost additives are added to the raw water cost of each water supply measure. Average and marginal cost pricing are implemented in the analysis simply by showing the retail price calculated by each method on the screening charts.

6.3 Availability and Allocation

Some new water supply measures are assumed to be available only to one particular demand region. Supply options that are assumed to be region-specific include Colorado River supplies, available just to the South Coast Region, local supplies in the San Francisco Bay Region and South Coast Region, and 300,000 acre-feet of conjunctive use supply in the Tulare Lake Region dedicated for local agricultural use. In the San Joaquin Valley and Sacramento Valley agriculture preference sets, agricultural conservation water is assumed to be available only to the local agricultural region.

Most supplies are assumed to be available to any water user willing to pay for them. In a water market, the water user willing to pay most for a supply would be able to obtain all of it. In this analysis, any water user willing to pay for a supply is able to obtain a share of it. This reflects the view that water provided by public projects would be provided to all water users who are willing and able to pay for it.

Frequently, both municipal demand regions are willing to pay for a supply measure. For purposes of analysis, the water provided by the supply measure is allocated between the San Francisco Bay and the South Coast Regions on the basis of their share of total CVP and SWP municipal water supply contracts. Table 6-2 shows the 2020 municipal CVP contract and SWP entitlement levels used to estimate shares. The shares provided to the San Francisco Bay and the South Coast Regions are 16.4 percent and 60.1 percent, respectively. A share of 23.6 percent is retained for other municipal regions not included in the analysis (Table 6-3).

TABLE 6-2
Municipal Water CVP Contracts and SWP Entitlements for Water Diverted from the Delta

	CVP Contracts (TAF)	SWP Entitlements (TAF)	Total	Shares
Shasta Area	37		37	1%
Sacramento Area	76		76	2%
Sacramento Valley Total	**113**		**113**	**3%**
North Bay Aqueduct		67	67	2%
Santa Clara Valley Water District and San Benito County, CVP Served	128		128	4%
South Bay Aqueduct and San Francisco		188	188	6%
Contra Costa Water District	167		167	5%
San Francisco Bay Region Total	**295**	**255**	**550**	**16.4%**
Central Valley Cities	29		29	1%
Bakersfield		143	143	4%
Central Valley Total	**29**	**143**	**172**	**5%**
Coastal Branch		50	50	2%
South Coast		2,014	2,014	60.1%
South Lahontan Region		454	454	14%
Southern California Total	**0**	**2,518**	**2,518**	**75%**
Total	**437**	**2,916**	**3,353**	**100%**

Table 6-4 shows the allocations assumed for some other situations in which multiple users are willing to pay for a supply. Occasionally, only the South Coast Region is willing to pay for a supply. In this case, it is assumed that the San Francisco Bay Region's share will be reallocated pro-rata to the other regions. This method provides the South Coast with a 71.8 percent share.

TABLE 6-3
Basis for Allocation Shares

Demand Region	Agricultural Water Re-allocated to Environment (TAF)	CVP & SWP Municipal Contracts (TAF)	Agricultural Reallocation Shares	Municipal Contract Urban Shares	Shares of Total
San Francisco Bay		550		16.4%	8%
South Coast		2,014		60.1%	30%
Sacramento River	270		23.7%		12%
San Joaquin River	210		18.4%		9%
Tulare Lake	640		56.1%		28%
"Other" Urban		790		23.6%	12%
"Other" Agricultural	20		1.8%		1%
Total	**1,140**	**4,031**	**100.0%**	**100.0%**	**100%**

TABLE 6-4
Share of New Supply Options

	Shares of Supplies (%) When Supplies Are Demanded (by region)					
Demand Region	**SC Only**	**SC & SFB**	**SC, SFB SJR & TL**	**All Demand Regions**	**All Except SFB**	**SR, SJR & TL**
San Francisco Bay		16.4	9.4	8.2		
South Coast	71.8	60.1	34.4	30.0	32.7	
Sacramento River				11.8	12.9	23.7
San Joaquin River			10.6	9.2	10.0	18.4
Tulare Lake			32.2	28.1	30.6	56.1
Other						
Agricultural				0.9	1.0	1.8
Urban	28.2	23.6	13.5	11.8	12.8	

SFB = San Francisco Bay Region
SC = South Coast Region
SR = Sacramento River Region
SJR = San Joaquin River Region
TL = Tulare Lake Region

For some supply measures in some preference sets, one or more agricultural demand regions is willing to pay for the water. Therefore, it was necessary to develop an allocation routine to allocate supplies among competing municipal and agricultural demand regions. There are two general types of allocation involving agricultural demand regions.

In the Type 1 allocation, some agricultural users are willing to pay for some supply measures even without subsidies. In this case, the water is first split 50/50 between

agricultural and M&I users. Then, allocation among agricultural regions is based on an estimated share of water reallocated to environmental purposes. These shares were estimated from CVPIA analysis (Reclamation, 1997). Table 6-3 shows the amount of water reallocated to environmental purposes, the municipal demand region contract shares, and the shares of total supply allocated to each demand region if all of the regions are willing to pay for the supply measure.

In the Type 2 allocation, the two agricultural preference sets include an allocation of conjunctive use and surface storage water to accommodate two factors: 1) compensation for water supplies not delivered now because of water reallocated to environmental purposes; and 2) area of origin concerns. The approach to allocate supplies is as follows:

1. For each supply measure, determine the amount of conjunctive use and surface storage taken by municipal demand regions up to their 50 percent allocation.
2. Determine the amount of the conjunctive use and surface storage water remaining for all agricultural demand regions.
3. Multiply this total agricultural amount by the regional shares in the third column of Table 6-3 (24, 18, and 56 percent) to determine target water supply shares for each agricultural demand region for each measure.
4. Provide water supply in the Sacramento Valley and in the San Joaquin Valley through local conjunctive use and surface storage in order of cost until the target water supplies in 3 are met.
5. Allocate the remaining supplies to the Tulare Lake Region.

In all scenarios, the Sacramento River Region can obtain all of its target supply from 3) from local conjunctive use and surface storage projects. The San Joaquin River Region also gets its entire supply from local projects. The Tulare Lake Region is not able to obtain its target supply from local projects, and most of the water needed to meet its target comes from the other regions. The Tulare Lake Region obtains all of the yield of South Delta improvements, an inexpensive supply measure not considered a "local" option for the Sacramento River or San Joaquin River Region; the Tulare Lake Region also obtains some of the more expensive water from both of the other regions. By assumption, all "replacement" water is provided to each agricultural region at one price regardless of source.

In some scenarios, at least one demand region is not willing to pay for its share of a supply, so the unwanted supply is allocated among other demand regions according to their share of the remaining demand. Table 6-4 summarizes some allocation shares from Tables 6-2 and 6-3 and shows some shares for supply measures when one region or more is not willing to pay for the water.

6.4 Price and Quantity Adjustments

Prior to adding the retail cost additive explained earlier in this section, all costs are expressed as raw water amount and cost delivered to the treatment plant. Numerous adjustments to the price and quantity of supply measures are required to correctly represent

their amounts and values at the treatment plant, and some of these adjustments affect baseline 2020 conditions.

6.4.1 Water Quality Costs

In this analysis, water quality costs are incurred for any water that passes through the Delta or the isolated facility. These costs are caused by regulatory standards for disinfection (D) and disinfection by-products (DBPs), especially bromates, and criteria for *Giardia* and *Cryptosporidium*. Existing standards, set in the Interim Enhanced Surface Water Treatment Rule (IESWTR) and Stage 1 D/DBP Rule, include a 10 µg/L Maximum Contaminant Level (MCL) for bromate (California Urban Water Agencies [CUWA], 1998). By May, 2002, EPA expects to promulgate the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) and Stage 2 D/DBP Rule. Although EPA is still negotiating the Stage 2 D/DBP Rule and acknowledges that the MCL may not be lowered, an MCL for bromate of 5 µg/L has been proposed (Schmelling, 1999).

With enhanced coagulation or ozone treatment, a bromide level of around 50 µg/L in water diverted from the Delta would be required to meet the 5 µg/L bromate standard. Preliminary information from CALFED (1999b) shows that bromide levels at Clifton Court with existing facilities would be less than 50 µg/L in only about 10 percent of months. At the Contra Costa Canal intake, a bromide goal of 50 µg/L would be met in less than 5 percent of months with existing facilities or with an isolated facility. These data suggest that enhanced coagulation or ozone treatment will violate the Stage 2 bromate MCL in these situations. Membrane technology is currently the least expensive technology that could be used instead. With an isolated facility, CALFED (1999b) estimates that a goal of 50 µg/L at Clifton Court would be met in more than 70 percent of months. In this situation, ozone treatment should be a viable treatment technology, and membrane technology would not be required.

Several alternative methods of meeting water quality standards that would not require membrane technology or an isolated facility were investigated. UV radiation may provide the additional levels of microbial inactivation proposed for the LT2ESWTR without producing unwanted DBPs, such as bromate. UV technology is expected to be inexpensive, but the technology is still untested at the scale needed to treat Delta water. Also, its ability to inactivate viruses is not yet well known. The effectiveness of UV radiation on inactivation of *Giardia* and *Cryptosporidium* is still being evaluated, although current study results indicate it is an effective means of inactivation. According to EPA, it is likely and reasonable to think that UV radiation will be approved as a treatment method for *Giardia*, for viruses, and, if required with the promulgation of LT2ESWTR, for *Cryptosporidium* in 2002 (Schmelling, 1999). The drinking water industry and researchers agree that UV radiation is showing promise as a process that can assist utilities in meeting proposed criteria for *Giardia* and *Cryptosporidium* (Mofidi, 1999; Malley, 1999). Despite the optimism of researchers and EPA, however, there are still engineering and design questions, as well as problems with monitoring dose and disinfection effectiveness, that must be addressed. The drinking water industry must be assured that UV radiation has no other significant impacts before it will adopt and invest in the technology as a method for microbial disinfection (Ilges, 1999).

Another alternative would use an exchange to replace Delta water with better quality water from the San Joaquin or Tulare Basin. The Delta water normally conveyed to southern

California would go to San Joaquin Valley agriculture, and San Joaquin Valley agriculture would give up local water supplies that would go to southern California. The physical and economic feasibility of this approach was investigated. The exchange would require a new facility to divert water from the Kings, Kaweah, Tule, and Kern Rivers and convey it to southern California. The cost of the necessary facilities was estimated to be $3.475 billion, which is substantially more than the isolated facility. This cost would not include costs required to induce agricultural water users to participate in the scheme. Compensation would be required, because Delta water is of lower quality for agricultural use.

A smaller exchange might prove economical, but economies are limited by a limited ability to blend the better quality water in the South Coast Region. Also, Delta water supplies are of such poor quality relative to the bromate standard that Delta water must be replaced on almost a 1-to-1 basis to meet the standard. Therefore, an exchange does not appear to be an economical option for meeting future drinking water standards.

These findings, with information on costs of treatment technologies and the isolated facility, result in different water quality costs with and without an isolated facility. An isolated facility also increases the amount of baseline supply by eliminating brine losses caused by membrane technology. A summary of costs is shown in Table 6-5.

TABLE 6-5
Screening Analysis Water Quality Costs without and with an Isolated Facility[a]

		Membrane Technology Cost (Million $)			Total Cost (Million $)	
Without Isolated Facility	**Reverse Osmosis ($ per acre-foot)**	**South Coast (0.8 MAF)**	**S.F. Bay Region (0.35 MAF)**	**Water Mix (South Coast)**	**South Coast**	**S.F. Bay Region**
Capital cost	$1,733	$1,386	$607		$1,386	$607
Annualized capital cost	$110	$88	$38		$88	$38
Annual variable cost	$248	$198	$84	$64	$262	$84
Total annual cost	$358	$286	$123	$64	$350	$123
Cost per acre-foot of all supplies[b]		$70	$111	$15	$85	$111

		Ozone Treatment Cost (Million $)		Membrane Technology Cost (Million $)	Isolated Facility Cost (Million $)		Total Cost (Million $)	
With Isolated Facility	**Ozone Treatment ($ per acre-foot)**	**South Coast (0.8 MAF)**	**S.F. Bay Region (0.2 MAF)**	**S.F. Bay Region (0.15 MAF)**	**South Coast (76%)**	**S.F. Bay Region (10%)**	**South Coast**	**S.F. Bay Region**
Capital cost	$433	$346	$87	$260	$1,054	$139	$1,400	$485
Annualized capital cost	$27	$22	$5	$16	$67	$9	$89	$31
Annual variable cost	$24	$19	$5	$37	$12	$2	$31	$43
Total annual cost	$51	$41	$10	$52	$79	$10	$120	$73
Cost per acre-foot of all supplies[b]		$10	$9	$47	$19	$9	$30	$66

[a] Costs exclude additional water quality costs with new Delta supplies in the dry condition.
[b] Cost per acre-foot of all supplies used in the region before any new supplies are acquired.

6.4.2 Water Quality Costs without the Isolated Facility

None of the seven preference sets include the isolated facility, so it is assumed that membrane technology is required for some of the baseline Delta water delivered to the South Coast and San Francisco Bay Regions for municipal use. Membrane technology costs are based primarily on information provided by Metropolitan (1999c). Metropolitan estimated that a membrane technology facility to treat 600,000 acre-feet will cost $1.04 billion dollars. It is assumed that:

1. Capital costs are $1,733 per acre-foot of capacity (10,400/6).

   The annualized value of this capital cost per acre-foot of capacity (50 years, 6 percent) is about $110.

2. Membrane technology capacities of 0.8 and 0.35 MAF would be required in the South Coast and San Francisco Bay Regions, respectively, to remove bromides from Delta water.

   The total annualized capital cost for membrane technology is $88 million (0.8 times $110) and $38 million (0.35 times $110) in the South Coast and San Francisco Bay regions, respectively.

3. Any water actually treated with membrane technology will require an additional variable cost of $248 per acre-foot.

   The annual average variable cost of membrane technology in the baseline condition is then $198 million (0.8 times $248) and $84 million in the South Coast and San Francisco Bay Regions, respectively, and the total annual cost including the capital cost is $286 million and $123 million, respectively (Table 6-5).

In the South Coast, one additional water quality cost is required. Delta water (200,000 acre-feet) is mixed with 600,000 acre-feet of Colorado River water at a cost of $80 per acre-foot. This mixing cost of $64 million raises the water quality cost in the South Coast to $350 million (Table 6-5).

Membrane technology results in a brine byproduct that must be disposed of, and the share of water remaining in the brine is not available as water supply. It is assumed that 10 percent of any water requiring membrane technology is lost. Therefore, baseline supplies in the South Coast and San Francisco Bay Regions are reduced by 80,000 and 30,000 acre-feet, respectively.

Metropolitan also provided revised membrane treatment costs based on more detailed considerations of amount and costs of membrane technology needed. Results of this cost analysis are discussed as a sensitivity analysis in Section 8.2.6, and the more detailed costs are included in the Urban Delta Exporters preference set. In summary, more membrane treatment capacity (1.95 MAF) would be required in the South Coast Region, but capital costs ($308 per AF) and O&M costs per acre-foot ($209) would be less than in the standard membrane treatment cost case ($358 and $248, respectively). The increased requirement for membrane treatment capacity increases the average cost of water, and additional brine losses of 115,000 AF (0.1 times [1.95-0.8]) increases demand for new supplies. More delta supplies are taken with the more detailed costs, because more supplies are needed, and variable treatment costs of Delta supplies are less ($209 versus $248).

The selection of the Membrane Treatment scenario with 800,000 AF of capacity in the South Coast is not based on a calculated assessment of the most likely 2020 scenario. Given expected water quality standards for 2020, the 800,000 AF of membrane treatment capacity may be too small. Water exchanges, mixing, and other management might be needed to accommodate 2020 water quality standards, or the standards might not be met as frequently. For purposes of this analysis, however, the variable cost of treatment is more important in determining which supplies are selected. The available analysis suggests a variable cost of $200 to $250 per AF. This cost range does not have a large influence on the supply options selected, so analysis with the more detailed cost data was not required of all preference sets.

6.4.3 Water Quality Costs with the Isolated Facility

A 10,000 cubic feet per second (cfs) isolated facility is evaluated as a sensitivity analysis on two preference sets: Unconstrained and Urban Delta Exporters. Based on earlier discussions, it is assumed that ozone treatment will be required for most municipal water conveyed by the isolated facility. Ozone treatment costs are based primarily on information provided by Metropolitan (1999c). It is assumed that:

1. Capital costs for ozone treatment of Delta water equal $433 per acre-foot.

   The annualized value of this capital cost per acre-foot of capacity (50 years, 6 percent) is about $27.

2. The amount of required ozone treatment capacity is 0.8 MAF in the South Coast and 200,000 acre-feet in the San Francisco Bay Regions. In the San Francisco Bay Region, 150,000 acre-feet of membrane technology capacity are required even with the isolated facility.

   Contra Costa Water District (CCWD) will not be served by the isolated facility, and a large share of CCWD supplies (150,000 acre-feet) will require membrane technology in any case.

   The total capital cost for ozone treatment is $346 and $87 million for the South Coast and San Francisco Bay Regions, and the annualized capital cost is $22 million and $5 million, respectively. The capital cost for membrane technology in the San Francisco Bay Region is $260 million, and the annualized capital cost is $16 million (Table 6-5).

3. Any water actually treated with ozone will require an additional variable cost of $24 per acre-foot.

   Total variable costs of treatment and membrane technology are $19 million and $42 million (37 plus 5) in the South Coast and San Francisco Bay Regions, respectively, and total annual water quality costs, without any new Delta supplies, are $41 million and $62 million (52 plus 10), respectively.

   Membrane technology results in a brine byproduct that must be disposed of, and the share of water remaining in the brine is not available as water supply. It is assumed that 10 percent of any water requiring membrane technology is lost. Baseline supplies in the San Francisco Bay Region are reduced by 15,000 acre-feet to account for the brine loss.

6.4.4 Isolated Facility Costs

CALFED (1998b) estimated the annual costs of a 5,000- and 15,000-cfs facility to be $82.6 and $124.9 million, respectively. The average of these costs is about $104 million. Another study provided by CALFED (1999c) estimated an annualized capital cost for a 10,000 cfs facility of $70 million. With annual operations and maintenance (O&M) costs from the earlier study, total annual cost would be about $86 million. The $104 million annual cost is used in the analysis.

This cost is allocated among the municipal water supply regions according to the share of total CVP contracts and SWP entitlement in each region. From Table 6-5, total annual cost assigned to the South Coast and San Francisco Bay Regions is $62.5 (0.601 times 104) and $17.1 (0.164 times 104) million, respectively. In the sensitivity analysis for the Urban Delta Exporters preference set, only 25 percent of the isolated facility cost would be paid by municipal Delta water users, so these costs are reduced to about $16 million and $4.3 million, respectively.

6.4.5 The Effect of Water Quality and Isolated Facility Costs on Screening of New Supplies

Water quality and isolated facility costs affect the screening and sensitivity analyses, because the costs and amounts of both new supplies and baseline supplies are affected. Some of the effects of water quality costs are summarized in Table 6-6.

TABLE 6-6
How Delta Water Quality Affects Screening and Sensitivity Analyses

1. Increased Price of Baseline Urban Supplies	
No IF:	1.15 MAF membrane technology, $473 million annual average cost, retail price increased by $50 to $120 per acre-foot
With IF:	1.0 MAF ozone treatment, 0.15 MAF membrane technology in San Francisco Bay, $193 million annual average cost, retail price increased by $15 to $75 per acre-foot
2. Amount of Baseline Supplies with Membrane Technology Reduced by Brine Loss	
No IF:	Dry condition Delta supplies for South Coast and San Francisco Bay reduced 80,000 and 30,000 acre-feet, respectively
With IF:	Dry condition Delta supplies for San Francisco Bay reduced 15,000 acre-feet
3. Increased Price of New Delta Supplies in Dry Condition	
No IF:	Variable cost per acre-foot of new Delta supplies is $248
With IF:	Variable cost per acre-foot of new Delta supplies is $24
4. Amount of New Delta Supplies Reduced by Brine Loss	
No IF:	Any supply measure passing through Delta reduced by 10 percent
With IF:	No brine loss

IF = Isolated facility

With the isolated facility, baseline supplies are increased by reduced membrane technology brine loss, so the amount of new supplies needed to meet demand is reduced. The order of selection of new supplies is affected because a large reduction in water quality costs increases the value of Delta supplies in comparison to other supplies. This is true for any

new supplies that require membrane technology without the isolated facility. Without the facility, any new Delta supplies include a cost of $248, and their effective price is increased 10 percent more by the brine loss required by membrane technology.

Isolated facility capital costs do not affect the order or selection of new supplies, because capital costs are fixed with respect to the amount of supplies used in the dry condition. It is assumed that there is excess isolated facility conveyance capacity in the dry condition, so no additional capacity is needed, and no additional capital cost is incurred by new supplies needed to meet dry-year conditions.

With average cost pricing, capital costs do affect the amount of new supplies selected, because capital costs can affect retail price and subsequent demand. Average cost pricing requires that an assigned share of capital costs be recovered through the price of water. Without any new supplies, the average cost of water is equal to the total cost of raw water, plus the water quality cost ($120 or $73 million from Table 6-5), all divided by the quantity of water delivered. The retail average cost is added to this average to get the retail price. With new supplies, more costs and more delivered water are added to the average cost estimate. The capital cost portion of the average cost declines with new supplies merely because a fixed number (the annual capital cost of facilities) is being divided by an increasing number (the amount of supply).

In preference sets with marginal cost pricing, the marginal cost of new supplies and the retail price are unaffected by the capital costs. Only the variable cost is recovered through the retail water price. The recovery of isolated facility or treatment capital costs under marginal cost pricing is not addressed here.

6.4.6 Delta Loss Factor

Not all new supply entering the Delta can be exported. The Delta export/import constraints set in the Bay-Delta Accord, water quality standards, and endangered species take limits result in the "loss" of a portion of new supply entering the Delta. The amount of the loss is highly variable and uncertain. For this study, it is assumed that any water transported through the Delta or through the isolated facility loses 20 percent of its quantity, and the effective price of the remainder is increased by 25 percent (1/0.80).

6.4.7 Reapplication Factor

Bulletin 160-98 adopts applied water as the basis for its calculations, and that convention is adopted here. A share of new supplies will be applied more than once. This is especially true in the agricultural demand regions where some proportion of applied irrigation water may be available through later reapplication (from tailwater or groundwater recharge, for example). Therefore, the yield of each new water supply is increased in each demand region according to the reapplication factors shown in Table 6-7. These factors are derived from Bulletin 160-98 tables on "Options Likely to be Implemented by 2020" where "Expected Reapplication" is shown in TAF.

TABLE 6-7
Reapplication Factors for Each Demand Region

Demand Region	Reapplication Factor
San Francisco Bay	1.0
South Coast	1.09
San Joaquin Valley	1.15
Tulare Lake Region	1.19
Sacramento River	1.21

6.4.8 Transport Cost

Conveyance costs are paid for every supply originating outside of a demand region. Table 6-8 shows the conveyance costs applied for each acre-foot of water delivered to each demand region from each origin. These are based on transport costs compiled for the water transfer analysis for CVPIA (Reclamation, 1997) and the Least Cost CVP Yield Increase Plan (Reclamation, 1995).

TABLE 6-8
Water Transport Costs ($/AF)

	From Origin			
To Demand Region	Sacramento Valley	San Joaquin Valley	Tulare Lake Region	Colorado River Region
Sacramento Valley				
San Joaquin Valley	30			
Tulare Lake	40	60		
San Francisco Bay Region	90	90	60	
South Coast	140	140	110	50

6.4.9 Water-Use Efficiency and Recycling Avoided Cost

Water conservation and water reuse generate an economic benefit in the form of reduced water treatment and distribution costs. All raw water costs are first measured at the treatment plant, so it is necessary to account for these savings to make water conservation and reuse costs comparable to the costs of other supplies. Information from Metropolitan (1999c) and Illingworth (1999) suggest that treatment costs are $80 per acre-feet; variable distribution costs are assumed to be $40 per acre-foot in the San Francisco Bay and $20 in the South Coast. Variable distribution costs are primarily energy costs needed for system pressure and pumping to higher-elevation service areas. Together, water reuse or conservation cost savings are $120 per acre-foot in the San Francisco Bay Region and $100 in the South Coast Region.

6.4.10 Wastewater Discharge Avoided Cost

Water reuse in the San Francisco Bay Region generates a water quality benefit by reducing wastewater loading in the San Francisco Bay. To account for this value, $500 per acre-foot is subtracted from water reuse costs in this region. This number is highly uncertain at this time. The true value will vary according to State Water Resources Control Board regulations.

6.4.11 Transaction Fee

A transaction fee of $25 is assumed to be paid for any acre-foot of water obtained by land fallowing, conjunctive use, or agricultural conservation and conveyed out of its area of origin. This cost is estimated to cover legal fees, environmental analysis, permits, negotiating costs, and other documentation requirements.

6.4.12 Price and Quantity Adjustments Summary

Tables 6-9 and 6-10 summarize the adjustments to raw water supply costs and quantities. Table 6-9 shows the formulas used to calculate price and quantity at destination; Table 6-10 summarizes the values for each adjustment factor.

TABLE 6-9
Price-Quantity Adjustment Formulas

1. **Price at Destination**

   $P_D = ((P_S/F_D + P_C + P_W + P_T + P_Q + P_R) \times (1+(1-F_B))/F_R)) + P_M$

   where

   P_D = Retail Price at Destination

   P_S = Price at Source

   F_D = Delta Loss Factor

   P_C = Transport Cost

   P_W = Wastewater Discharge Avoided Cost

   P_T = Transaction Fee

   P_Q = Delta Water Quality Cost

   P_R = WUE and Recycling Avoided Cost

   F_B = Membrane Treatment Brine Loss Factor (= 1.0 or 0.9)

   F_R = Reapplication Factor

   P_M = Retail Price Adjustment

2. **Quantity at Destination**

   $Q_D = Q_S \times F_R \times F_D \times F_A \times F_B$

   where

   Q_D = Quantity at Destination

   Q_S = Quantity at Source

   F_A = Share of New Supplies Factor

TABLE 6-10
Price Quantity Adjustment Data

Price Adjustments	**$/Acre-Foot Adjustment Under Condition:**				
P_C = Transport Cost	**To TL**	**To SJ**	**To SFB**	**To SC**	
From Tulare Lake Region			$60	$110	
From Sacramento River Region	$40	$30	$90	$140	
From San Joaquin River Region	$60		$90	$140	
From Colorado River Region				$50	
P_W = Wastewater Discharge Avoided Cost	$500 benefit for water reuse in the San Francisco Bay Region				
P_T = Transaction Fee	$25 for any land fallowing, agricultural conservation, or conjunctive use moved out of source region				
P_Q =Delta Water Quality Cost					
Without IF	$248 for any water passing through Delta				
With IF	$24 for any water passing through Delta				
P_R = WUE and Recycling Avoided Cost					
Distribution System Improvements	$50 reduction for any urban distribution system WUE				
Other Improvements	$100 reduction for any other WUE or recycling				
P_M = Retail Price Adjustment	$500 in South Coast and $482 in San Francisco Bay Regions				
Quantity Adjustments					
F_D = Delta Loss Factor	80 percent of any water passing through Delta is retained				
F_B = Membrane Treatment Brine Loss Factor	90 percent of any water passing through Delta is retained				
F_R = Reapplication Factor	Increase in applied water per unit increase in new water:				
	In TL	**In SJ**	**In SR**	**In SFB**	**In SC**
	1.19	1.15	1.21	1.00	1.09
F_A = Share of New Supplies Factor	Varies according to which regions find the supply cost-effective				

IF = Isolated facility

6.5 How Preference Sets Affect the Selection of Supply Options

The seven preference sets affect the selection of supplies by controlling the quantity or affecting the unit cost of supply measures.

Quantity-related preferences usually set an upper or lower limit on the use of an option. Some of the preferences remove particular supply measures from consideration. This means that more expensive supply measures must be used instead. Some of the preferences require that certain supply measures be used. This type of preference also increases average water supply costs if the required supply would not be screened in otherwise.

The other important form of preference involves price. Preferences that affect price generally affect the ordering of supplies. One important exception is that agricultural use is increased by lower prices in the agricultural preference sets. Two of the agricultural preference sets require new supplies at existing prices, regardless of their costs. These lower prices result in more water use in the agricultural regions. Through the allocation routine described earlier in this chapter, the increased agricultural use is subtracted from the supplies available for municipal use. With fewer municipal supply measures and inelastic demand, more expensive supplies must be obtained for municipal use.

The preference for type of pricing generally has little impact on the selection of supplies. This is because urban demand is inelastic. The marginal cost of supplies must differ significantly from the average for the pricing preference to have any effect.

Chapter 7

Results

7. Results

This section summarizes and discusses the results of the analysis by preference set and demand region. The demand and supply graphs and supply data for all stakeholder preference sets, presented in Appendix A, are introduced and explained. Results for the Unconstrained scenario are presented first. This scenario is the baseline for comparison with stakeholder preference sets. The important elements of each preference set are reviewed, and the results for each preference set and demand region are discussed. Results of sensitivity analyses are presented in Section 8.2.

7.1 Interpreting the Demand and Supply Graphs and the Supply Data Tables

Results for all regions are provided in Appendix A. Results for the Unconstrained preference set for the South Coast region are also provided in Figure 7-1 and Table 7-1, and results for the Tulare Lake region are provided in Figure 7-2 and Table 7-2. The description presented here for the interpretation of these charts and tables provides guidance for the interpretation of the charts and graphs in Appendix A.

The two curves in Figure 7-1 show the demand for urban water supply in the South Coast under two conditions. The red demand function (to the right) is 2020 demand that would exist without the influence of BMPs, new plumbing ordinances, and natural replacement. (For all other demand regions, this demand function just excludes the effect of BMPs as defined by DWR). The blue demand function (to the left) is the function actually expected in 2020 with all planned and expected conservation savings. The brown arrow, from left to right, is labeled with the amount of expected savings.

Supply data are marked with triangles for the marginal cost of supplies, or with squares for the average cost of supplies. Both of these supply data include the cost addition needed to express costs at the retail level. Marginal costs and average costs are increasing because the marginal costs are ordered from least to most expensive, and the average increases as more expensive supply measures are averaged in. The average cost increases little over the range of supply measures, primarily because the average includes all existing supplies used before those shown on the graph.

Table 7-1 shows the supply measures included on the graph and all other supply measures available to this demand region in this preference set. Those measures under "Options screened to meet demand" are to the left of the blue (left) demand function. The quantity of the last individual supply measure has been split to make demand and supply exactly equal. The average costs of the last supply measures in this group define the cost of supply measures used. For example, the average cost of all supplies used (5.851 MAF) is $287 per acre-foot at the treatment plant or $787 per acre-foot delivered, so the total cost is about $1.679 billion (5.851 times $287) at the treatment plant. Total retail revenue from water sales, not including service charges, connection fees, or other charges, is about $4.605 billion.

Additional measures to the right of the demand function and all other potential measures are listed in Table 7-1, but they are not included in the selected supply measures in 2020. They might be interpreted as the next supplies that would be chosen sometime after 2020, with additional demand.

Figure 7-2 shows results for the Tulare Lake region. For purposes of illustrating the demand relationships, the figure shows potential demand as high as 10.4 million acre-feet. In fact, none of the scenarios indicated that quantity demanded would exceed about 9.5 million acre-feet. In the Unconstrained scenario, the region elects to use only four supply measures, and almost all of the new water supply comes from one measure — the Kern Water Bank. Table 7-2 shows that two small supply measures to the right of the demand function in Figure 7-2 are actually allowed in the screened scenario. This is allowed, only for this region, because some portion of the Kern Water Bank is actually being used now. Therefore, the yield of this option is slightly over-represented, and the measures just to the right of the demand function would probably be used if the Kern Water Bank yield were corrected.

The new water supplies have little effect on average cost. Note that, at the average cost of $60 to $65 per acre-foot, there is additional demand for water, but this does not necessarily justify the acquisition of additional supplies costing more than $200 per acre-foot. To maximize aggregate net returns to farmers, the region should stop acquiring supplies where the marginal cost of new supplies equals the MV of water as expressed by the demand.

7.2 Unconstrained Preference Set

This preference set shows the supply measures that would be used in 2020 without subsidies, constrained only by physical limitations and economic costs. Any supply measure for municipal use passing through the Delta incurs a $248 per acre-foot water quality treatment cost.

7.2.1 San Francisco Bay Region

About 212 TAF of new supplies are developed, of which 100 TAF (47 percent) are recycled supplies, 64 TAF (30 percent) are urban WUE, 21 TAF (10 percent) are non-local active conjunctive use, and 9 TAF (4 percent) are non-local surface storage. The remaining 9 percent of new supplies is from Tulare Lake region agricultural WUE, local conjunctive use and surface storage, and south Delta improvements. The total cost of screened supplies to retail users is about $181 million annually. The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,123 and $854 per acre-foot, respectively.

7.2.2 South Coast Region

About 1,764 TAF of new supplies are developed, of which 218 TAF (12 percent) are recycled supplies, 437 TAF (25 percent) are urban WUE, 188 TAF (11 percent) are non-local active conjunctive use, 352 TAF (20 percent) are non-local surface storage, and 138 TAF (8 percent) are from land fallowing. Most of the remaining 24 percent of new supplies are imported from the Colorado River basin, with relatively small amounts from local conjunctive use and agricultural WUE. The total cost of screened supplies to retail users is about $1,737

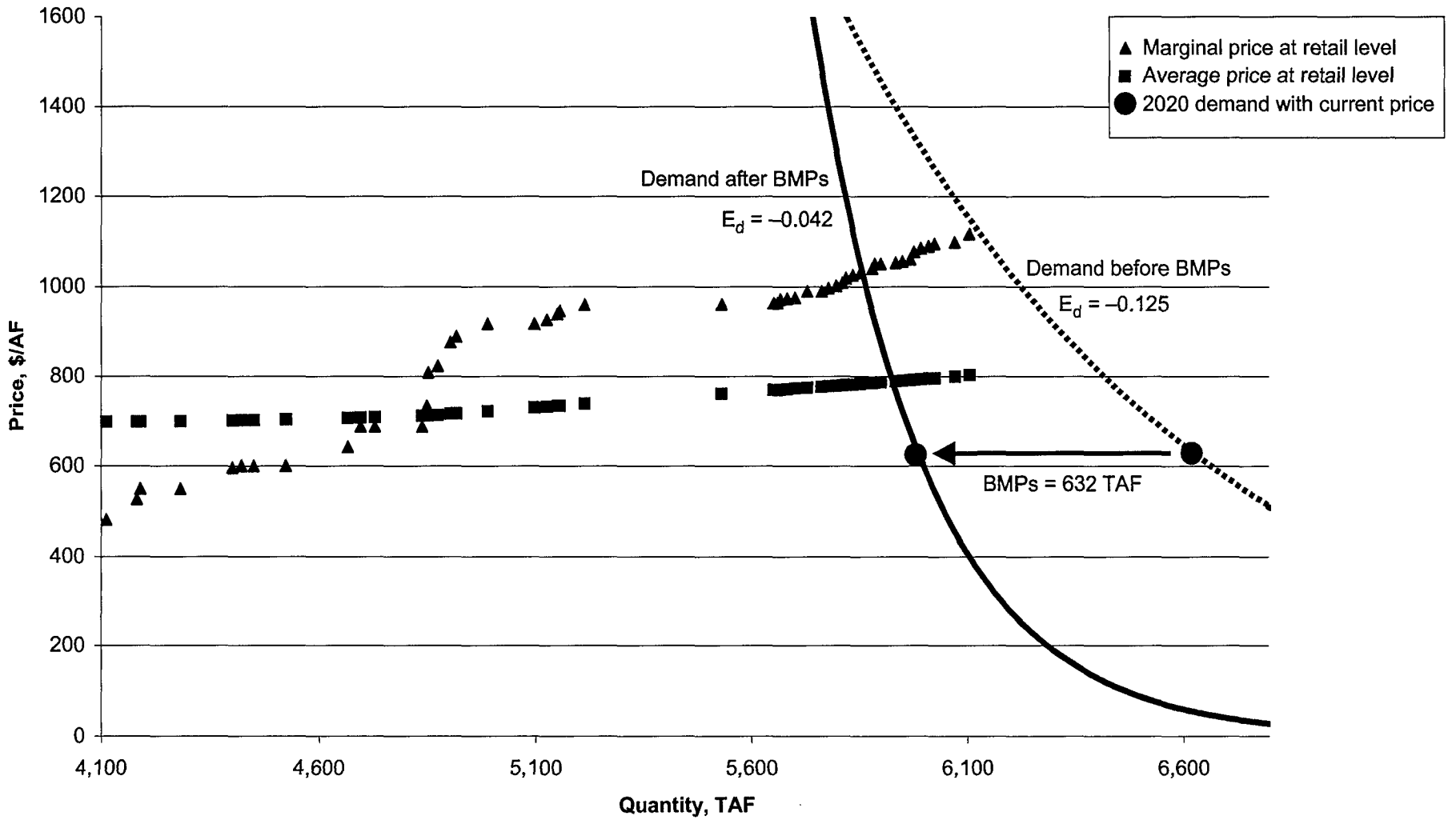

Chart 7-1
Screening Level Analysis
Unconstrained Preference Set
South Coast Region

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TABLE 7-1
Supply Data for Screening Level Analysis, Unconstrained Preference Set
South Coast Region

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demanc																					
															$202.02				4087		
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$202	$325	$500	24.0	4111.0	$486	$702
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$208	$202	$325	$500	70.9	4,181.8	$531	$702
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$202	$325	$500	7.6	4,189.5	$554	$702
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$202	$325	$500	91.6	4,281.0	$554	$702
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$204	$325	$500	119.9	4,400.9	$600	$704
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$205	$325	$500	20.7	4,421.6	$605	$705
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$205	$325	$500	28.3	4,450.0	$605	$705
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$207	$325	$500	74.1	4,524.1	$605	$707
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$210	$325	$500	141.7	4,665.8	$646	$710
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$211	$325	$500	29.4	4,695.2	$692	$711
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$212	$325	$500	32.7	4,727.9	$692	$712
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$216	$325	$500	109.0	4,836.9	$692	$716
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$216	$325	$500	10.9	4,847.8	$738	$716
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$248	$0	$0	$487	$216	$325	$500	2.4	4,850.2	$812	$716
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.344	$140	$0	$248	$0	$0	$503	$217	$325	$500	21.9	4,872.1	$828	$717
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$555	$219	$325	$500	29.5	4,901.6	$880	$719
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.344	$140	$25	$248	$0	$0	$588	$220	$325	$500	13.5	4,915.1	$893	$720
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$226	$325	$500	73.0	4,988.1	$921	$726
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$234	$325	$500	109.0	5,097.1	$921	$734
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	10%	0.601	$140	$25	$248	$0	$0	$606	$236	$325	$500	28.3	5,125.4	$931	$736
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	10%	0.601	$140	$25	$248	$0	$0	$619	$238	$325	$500	23.6	5,149.0	$944	$738
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$626	$238	$325	$500	5.3	5,154.3	$951	$738
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	10%	0.601	$110	$25	$248	$0	$0	$639	$243	$325	$500	59.0	5,213.3	$964	$743
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$640	$265	$325	$500	317.0	5,530.2	$965	$765
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$273	$325	$500	119.9	5,650.1	$967	$773
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$643	$274	$325	$500	8.5	5,658.6	$968	$774
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$651	$274	$325	$500	5.6	5,664.2	$976	$774
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$652	$275	$325	$500	15.8	5,680.0	$977	$775
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$654	$277	$325	$500	18.0	5,698.0	$979	$777
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$669	$278	$325	$500	28.2	5,726.2	$994	$778
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$669	$281	$325	$500	33.8	5,760.0	$994	$781
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$676	$282	$325	$500	15.8	5,775.8	$1,001	$782
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$681	$283	$325	$500	18.0	5,793.8	$1,006	$783
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$688	$284	$325	$500	14.2	5,808.0	$1,013	$784
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$696	$285	$325	$500	8.5	5,816.5	$1,023	$785
Land Fallow	Sacramento	Range 7	28	$228	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$705	$286	$325	$500	15.8	5,832.2	$1,030	$786
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$710	$287	$325	$500	18.0	5,850.3	$1,035	$787
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.029	$140	$25	$248	$0	$0	$720	$287	$325	$500	1.1	5,851.4	$1,045	$787
Additional options to the right of the demand function (after BMPs																					
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.668	$140	$25	$248	$0	$0	$720	$289	$325	$500	27.0	5,878.4	$1,045	$789
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$290	$325	$500	5.7	5,884.1	$1,055	$790
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$291	$325	$500	14.2	5,898.3	$1,055	$791
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.455	$140	$25	$248	$0	$0	$732	$292	$325	$500	21.4	5,919.7	$1,057	$792
Additional options to the right of the demand function if AC pricing is used (after BMP																					
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.263	$140	$25	$248	$0	$0	$732	$293	$325	$500	12.4	5,932.1	$1,057	$793
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$735	$294	$325	$500	15.8	5,947.9	$1,060	$794
Land Fallow	Sacramento	Range 12	32	$256	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$740	$296	$325	$500	18.0	5,965.9	$1,065	$796
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$756	$296	$325	$500	8.5	5,974.4	$1,081	$796
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$763	$298	$325	$500	15.8	5,990.1	$1,088	$798
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$768	$299	$325	$500	18.0	6,008.2	$1,093	$799
Land Fallow	Sacramento	Range 15	25	$283	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$774	$300	$325	$500	14.1	6,022.2	$1,099	$800
Land Fallow	Tulare	Range 1	67	$387	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$777	$304	$325	$500	47.2	6,069.4	$1,102	$804
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$795	$307	$325	$500	33.8	6,103.3	$1,120	$807
Additional options that meet screening criteria but are more expensive than those shown on the ch																					

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TABLE 7-1
Supply Data for Screening Level Analysis, Unconstrained Preference Set
South Coast Region

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Land Fallow	Sacramento	Range 16	25	$317	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$817	$308	$325	$500	14.2	6,117.4	$1,142	$808
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$336	$325	$500	359.7	6,477.1	$1,151	$836
Land Fallow	San Joaquin	Range 4	12	$406	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$826	$337	$325	$500	8.5	6,485.6	$1,151	$837
Land Fallow	Tulare	Range 2	67	$438	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$828	$341	$325	$500	47.2	6,532.8	$1,153	$841
Land Fallow	Sacramento	Range 17	10	$355	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$864	$341	$325	$500	5.6	6,538.4	$1,189	$841
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$866	$341	$325	$500	3.5	6,541.9	$1,191	$841
Land Fallow	Sacramento	Range 18	25	$362	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$873	$343	$325	$500	14.1	6,556.0	$1,198	$843
Land Fallow	San Joaquin	Range 5	21	$452	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$873	$344	$325	$500	14.8	6,570.8	$1,198	$844
Land Fallow	Tulare	Range 3	67	$490	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$881	$348	$325	$500	47.2	6,618.0	$1,206	$848
Land Fallow	Tulare	Range 4	36	$492	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$883	$350	$325	$500	25.4	6,643.4	$1,208	$850
Land Fallow	San Joaquin	Range 6	12	$483	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$904	$350	$325	$500	8.5	6,651.8	$1,229	$850
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$359	$325	$500	109 0	6,760.8	$1,242	$859
Land Fallow	Tulare	Range 5	36	$540	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$932	$362	$325	$500	25.4	6,786.2	$1,257	$862
Land Fallow	Tulare	Range 6	67	$542	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$933	$366	$325	$500	47.2	6,833.4	$1,258	$866
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$367	$325	$500	20.7	6,854.1	$1,265	$867
Land Fallow	San Joaquin	Range 7	21	$522	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$943	$369	$325	$500	14.8	6,868.9	$1,268	$869
Land Fallow	Tulare	Range 7	36	$588	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$980	$371	$325	$500	25.4	6,894.2	$1,305	$871
Land Fallow	Tulare	Range 8	67	$594	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$986	$375	$325	$500	47.2	6,941.4	$1,311	$875
Land Fallow	Tulare	Range 9	19	$607	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$999	$376	$325	$500	13.4	6,954.8	$1,324	$876
Land Fallow	San Joaquin	Range 8	21	$590	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,012	$377	$325	$500	14.8	6,969.6	$1,337	$877
Land Fallow	Tulare	Range 10	36	$635	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,027	$380	$325	$500	25.4	6,994.9	$1,352	$880
Land Fallow	Tulare	Range 11	19	$648	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,041	$381	$325	$500	13.4	7,008.3	$1,366	$881
Land Fallow	Sacramento	Range 19	10	$510	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,060	$382	$325	$500	5.6	7,014.0	$1,385	$882
Land Fallow	Tulare	Range 12	36	$683	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,076	$384	$325	$500	25.4	7,039.3	$1,401	$884
Land Fallow	Tulare	Range 13	19	$688	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,081	$385	$325	$500	13.4	7,052.7	$1,406	$885
Land Fallow	San Joaquin	Range 9	21	$659	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,082	$387	$325	$500	14.8	7,067.5	$1,407	$887
Land Fallow	San Joaquin	Range 10	13	$694	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,117	$388	$325	$500	9.2	7,076.6	$1,442	$888
Land Fallow	Tulare	Range 14	19	$730	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,123	$389	$325	$500	13.4	7,090.0	$1,448	$889
Land Fallow	San Joaquin	Range 11	21	$728	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,152	$391	$325	$500	14.8	7,104.8	$1,477	$891
Land Fallow	San Joaquin	Range 12	13	$734	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,157	$392	$325	$500	9.2	7,114.0	$1,482	$892
Land Fallow	Tulare	Range 15	19	$771	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,165	$393	$325	$500	13.4	7,127.4	$1,490	$893
Land Fallow	San Joaquin	Range 13	13	$775	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,199	$394	$325	$500	9.2	7,136.5	$1,524	$894
Land Fallow	San Joaquin	Range 14	13	$815	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,239	$395	$325	$500	9.2	7,145.7	$1,564	$895
Land Fallow	Sacramento	Range 20	10	$666	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,257	$396	$325	$500	5.6	7,151.3	$1,582	$896
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$1,276	$422	$325	$500	218.4	7,369.7	$1,601	$922
Land Fallow	San Joaquin	Range 15	13	$856	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,281	$423	$325	$500	9.2	7,378.8	$1,606	$923
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$426	$325	$500	20.7	7,399.5	$1,609	$926
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$438	$325	$500	109.0	7,508.5	$1,609	$938
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$488	$325	$500	474.2	7,982.7	$1,609	$988
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,345	$489	$325	$500	3.5	7,986.2	$1,670	$989
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develo	179	$1,850	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$511	$325	$500	195.1	8,181.3	$1,747	$1,011
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$524	$325	$500	88.3	8,269.6	$2,068	$1,024
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,900	$529	$325	$500	31.0	8,300.6	$2,225	$1,029
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,931	$530	$325	$500	4.9	8,305.5	$2,256	$1,030
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$2,309	$532	$325	$500	8.5	8,314.0	$2,634	$1,032

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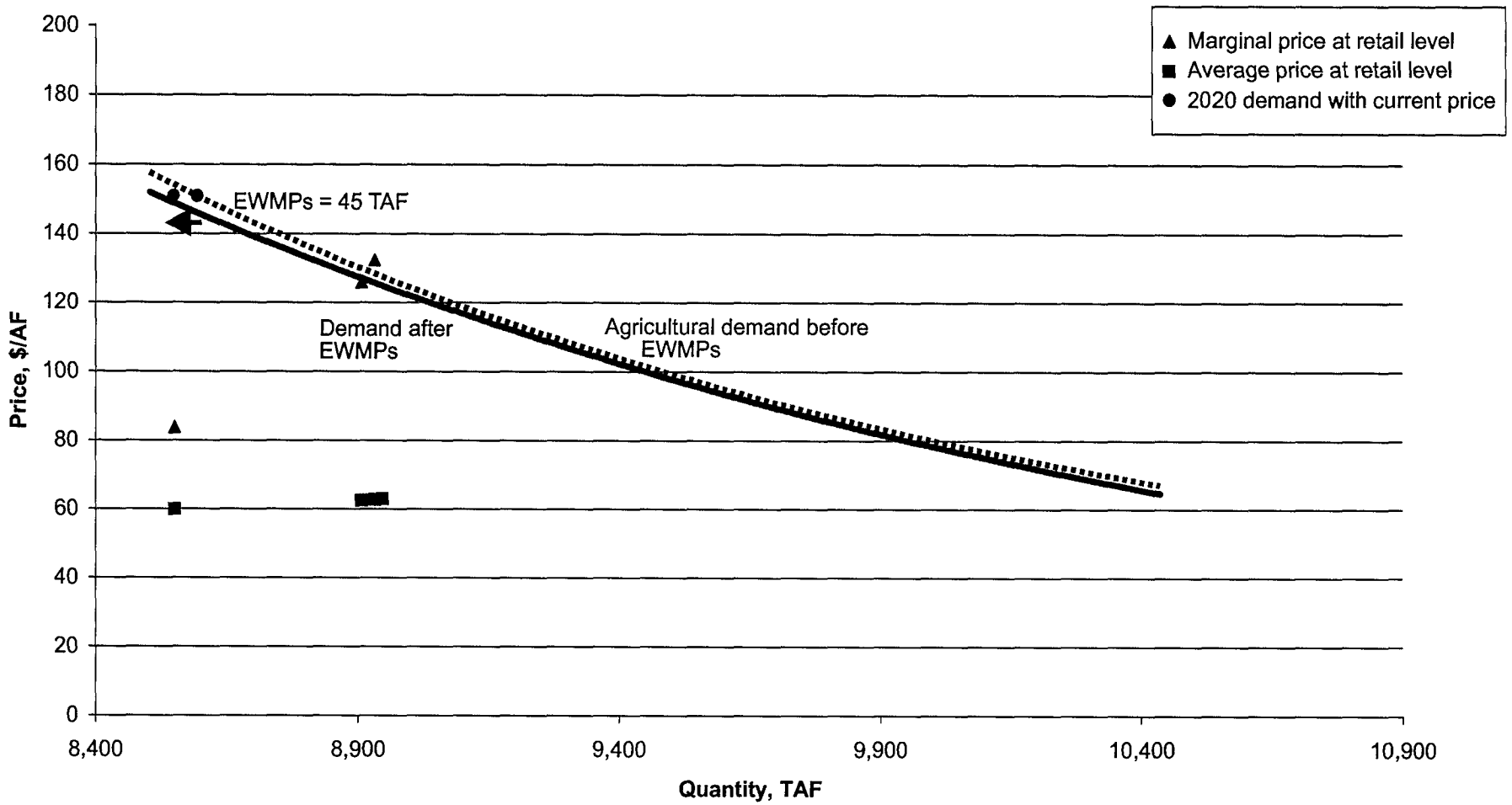

Chart 7-2
Screening Level Analysis
Unconstrained Preference Set
Tulare Lake Region

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TABLE 7-2
Supply Data for Screening Level Analysis, Unconstrained Preference Set
Tulare Lake Region

Option			At Source (dry condition)							At Destination			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (taf/year)	At Farm Dry P ($/af)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
												8547		60
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,907	$126	$62.65
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,932	$132	$62.85
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0.322	$60	$25	15.3	$211	8,947	$211	$63.10

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million annually. The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,045 and $984 per acre-foot, respectively.

7.2.3 Sacramento River Region

No new supplies are used in the region because maximum willingness to pay is less than the minimum cost of new supply measures.

7.2.4 San Joaquin River Region

About 14 TAF of new water supply is applied in the region. Most of this (8 TAF) is yield from South Delta improvements. The remainder is local conjunctive use (5 TAF) and agricultural WUE.

7.2.5 Tulare Lake Region

About 215 TAF of new water supply is applied in the region. Most of this (178 TAF) is yield from local conjunctive use. Much of this supply may already be in use. Additional supplies include South Delta improvements (25 TAF of applied water), 3 TAF of agricultural WUE, and 8 TAF of active conjunctive use from the San Joaquin Valley.

7.3 Environmental Preference Set

Important elements include a requirement for urban water recycling up to one-half of identified amounts, dedication of one-half of conjunctive use yield to environmental purposes, and no new storage. In comparison to the Unconstrained preference set, municipal supplies include more recycling and more land fallowing but less active conjunctive use and no surface storage.

7.3.1 San Francisco Bay Region

Supplies include 100 TAF of recycling (47 percent of screened supplies). This amount is the same amount as in the Unconstrained preference set. The amount of land fallowing (10 TAF, 5 percent) is higher, but less active conjunctive use (19 TAF, 9 percent) and no surface storage are selected. The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,156 and $857 per acre-foot, respectively. In comparison to the Unconstrained preference set, the cost of the Environmental preference set has only a small effect on costs of water supply measures screened.

7.3.2 South Coast Region

In comparison to the Unconstrained preference set, municipal supplies include more recycling (436 TAF, 25 percent), more land fallowing (296 TAF, 18 percent), less active conjunctive use (141 TAF, 8 percent), and no surface storage. The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,142 and $1,056 per acre-foot, respectively. In comparison to the Unconstrained preference set, the Environmental preference set increases annual water supply cost by about $103 million annually.

7.3.3 Sacramento River Region

No new supplies are used.

7.3.4 San Joaquin River Region

Results are identical to those for the Unconstrained preference set, except that active conjunctive use yields are reduced by half.

7.3.5 Tulare Lake Region

Results are identical to those for the Unconstrained preference set, except that active conjunctive use yields are reduced by half.

7.4 Urban Delta Exporters Preference Set

Important elements include a limit on any additional municipal conservation (urban WUE) beyond that implemented by BMPs, existing ordinances, and natural replacement. The limit on additional conservation reflects a belief that additional conservation will not be cost-effective. Stakeholders representing this preference set emphasize that additional urban WUE would be implemented in the future if it appeared to become cost-effective.

In comparison to the Unconstrained preference set, no additional urban WUE is selected. Instead, more water recycling, active conjunctive use, and land fallowing are selected.

7.4.1 San Francisco Bay Region

Screened water supplies are primarily new stored water (30 TAF, 13 percent), recycling (100 TAF, 43 percent), conjunctive use (30 TAF, 13 percent), and urban WUE (62 TAF, 27 percent). The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,082 and $868 per acre-foot, respectively.

Costs of water supplies are increased in comparison to the Unconstrained preference set by about $19 million.

7.4.2 South Coast Region

New urban WUE (437 TAF) taken in the Unconstrained preference set is replaced with additional recycling, land fallowing, active conjunctive use, and other supplies. Screened water supplies are primarily new stored water (354 TAF, 18 percent), recycling (258 TAF, 13 percent), active conjunctive use (282 TAF, 15 percent), and land fallowing (231 TAF, 12 percent). The amount of water from land fallowing measured at the origin is about 400 TAF, the maximum allowed by the preference set. The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,561 and $1,097 per acre-foot, respectively.

Costs of water supplies are increased in comparison to the Unconstrained preference set by about $370 million. This cost results from additional cost of membrane treatment and the use of higher cost measures instead of urban WUE. Again, this preference set excludes the additional urban WUE because it is thought to be uneconomical.

7.4.3 Sacramento River Region

No new supplies are used.

7.4.4 San Joaquin River Region

Results are identical to those for the Unconstrained preference set.

7.4.5 Tulare Lake Region

Results are identical to those for the Unconstrained preference set.

7.5 Urban In-Delta Diverters Preference Set

Results are similar to the Unconstrained preference set, except that average cost pricing of water is used instead of marginal cost pricing.

7.5.1 San Francisco Bay Region

The lower water price resulting from average cost pricing increases the use of new supplies by 17 taf relative to the Unconstrained preference set. The additional supplies are active conjunctive use (9 taf) and new surface storage (8 taf).

7.5.2 South Coast Region

The lower water price resulting from average cost pricing increases the use of new supplies by 69 taf. The additional supplies are land fallowing (20 taf) and active conjunctive use (49 taf).

7.5.3 Sacramento River Region

Results are identical to those for the Unconstrained preference set.

7.5.4 San Joaquin River Region

Results are identical to those for the Unconstrained preference set.

7.5.5 Tulare Lake Region

Results are identical to those for the Unconstrained preference set.

7.6 Delta Agriculture Preference Set

This preference set requires that all potential urban water recycling and WUE be used before any additional water can be exported from the Delta. In comparison to the Unconstrained preference set, there is no active conjunctive use, new surface storage, or land fallowing in the screened scenario.

7.6.1 San Francisco Bay Region

Screened supplies include 100 TAF (44 percent) of recycled water and 103 TAF (45 percent) of new WUE, with a small amount from other local sources. The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,332 and $918 per acre-foot, respectively. Costs of screened supplies are increased by about $29 million relative to the Unconstrained preference set.

7.6.2 South Coast Region

Screened supplies include 573 TAF (32 percent) of recycled water and 458 TAF (25 percent) of new WUE, with the remainder from other local sources, especially Colorado River supplies. The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,609 and $1,141 per acre-foot, respectively. Costs of screened supplies are increased by about $340 million relative to the Unconstrained preference set.

7.6.3 Sacramento River Region

No new supplies are used.

7.6.4 San Joaquin River Region

Results are identical to those for the Unconstrained preference set, except that the region obtains more water from South Delta improvements.

7.6.5 Tulare Lake Region

Results are identical to those for the Unconstrained preference set.

7.7 Sacramento Valley Agriculture Preference Set

Important elements include subsidies for agricultural users to compensate for past water losses, reduced supply from active conjunctive use in the Sacramento Valley, reduced availability of water from land fallowing, and retention of agricultural water conservation savings for local water use.

In comparison to the Unconstrained preference set, agricultural users obtain much more screened supplies. In total, more water is used. Municipal water supplies consist of more recycling and local supplies, because less land fallowing water is available, and more of the inexpensive stored water is used by agriculture.

7.7.1 San Francisco Bay Region

This region exhibits a pattern of results somewhat different from the two municipal regions combined. In comparison to the Unconstrained preference set, less active conjunctive use (16 TAF, 7 percent) is used, and this reduction is replaced with new surface storage (33 TAF, 14 percent). Use of other supplies is about the same as in the Unconstrained preference set. The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,124 and $881 per acre-foot, respectively. Costs of screened supplies are increased by about $21 million annually relative to the Unconstrained preference set.

7.7.2 South Coast Region

In comparison to the Unconstrained preference set, less active conjunctive use (90 TAF, 5 percent), surface storage (165 TAF, 9 percent) and land fallowing (none) are used, and more recycling (327 TAF, 18 percent) and other local supplies (692 TAF, 38 percent) are used. The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,601 and $1,050 per acre-foot, respectively. Costs of screened supplies are increased by about $182 million annually relative to the Unconstrained preference set.

7.7.3 Sacramento River Region

The region obtains 234 TAF of new supply for agricultural use, costing about $62 million annually. At $30 per acre-foot, the region will pay $7 million annually for this supply. All new supply comes from local surface and conjunctive use storage projects.

7.7.4 San Joaquin River Region

The region obtains 182 TAF of new supply for agricultural use, costing about $87 million annually. At $45 per acre-foot, the region will pay $8.2 million annually for this supply. All new supply comes from local surface and conjunctive use storage projects.

7.7.5 Tulare Lake Region

The region obtains 913 TAF of new supply for agricultural use, costing about $382 million annually. At $60 per acre-foot, the region will pay $55 million annually for this supply. New supply comes from local and non-local surface and conjunctive use storage projects.

7.8 San Joaquin Valley Agriculture Preference Set

Important elements of this preference set include subsidies for agricultural users to compensate for past water losses, reduced yield from active conjunctive use in the San Joaquin Valley, reduced availability of water from land fallowing, and the retention of agricultural WUE savings for local water use.

In comparison to the Unconstrained preference set, agricultural users obtain much more screened supplies. In total, more water is used. Municipal water supplies consist of more recycling, WUE, and local supplies, because less land fallowing water is available, and more of the inexpensive stored water is used by agriculture.

7.8.1 San Francisco Bay Region

In comparison to the Unconstrained preference set, less active conjunctive use (16 TAF, 8 percent) and land fallowing (none) are used. This change is offset by more surface storage (15 TAF, 7 percent). The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,124 and $858 per acre-foot, respectively. Costs of screened supplies are increased by about $1 million relative to the Unconstrained preference set.

7.8.2 South Coast Region

In comparison to the Unconstrained preference set, less active conjunctive use (120 TAF, 7 percent), land fallowing (none), and surface storage (150 TAF, 8 percent) are used. More recycling (327 TAF, 18 percent) and WUE (445 TAF, 24 percent) are used. Use of other local supplies increases to 38 percent. Active conjunctive use and surface storage are bid away by agriculture, and less fallowing is available as a matter of preference. The marginal and average cost of new supplies, including the cost additive to the retail level, are $1,265 and $1,044 per acre-foot, respectively. Costs of screened supplies are reduced by about $172 million relative to the Unconstrained preference set.

7.8.3 Sacramento River Region

The region obtains 255 TAF of new supply for agricultural use, costing about $46 million annually. At $30 per acre-foot, the region will pay $7.6 million annually for this supply.

7.8.4 San Joaquin River Region

The region obtains 198 TAF of new supply for agricultural use, costing about $119 million annually. At $45 per acre-foot, the region will pay $9 million annually for this supply.

7.8.5 Tulare Lake Region

The region obtains 962 TAF of new supply for agricultural use, costing about $380 million annually. At $60 per acre-foot, the region will pay about $58 million annually for this supply.

Chapter 8

Discussion

8. Discussion

8.1 Summary and Interpretation of Results

Results described in the previous chapter indicate differences and similarities in least-cost combinations of supply and demand measures, especially in urban demand regions. The purpose of this chapter is to summarize the similarities and differences among scenarios.

8.1.1 South Coast Region

Supply options for the South Coast Region are summarized by the scenario illustrated in Figure 8-1. Options total between about 1.74 and 1.92 MAF for the dry condition. This disparity results from variations in brine losses among the preference sets and from price-induced demand response resulting from variation in costs and type of pricing selected.

All scenarios include some agricultural WUE, urban recycling, and "Other" options (primarily South Delta improvements and Colorado River options). All but the Delta Agriculture scenario include conjunctive use and all but the three scenarios based on agricultural preference sets include land fallowing options. All except the Delta Agriculture and Environmental scenarios include at least 150 TAF of supply from surface storage. All but the Urban Delta Exporters scenario include additional urban water conservation of about 440 TAF.

Land fallowing measures play the largest role in supply for the South Coast in the Environmental scenario, totaling about 300 TAF of dry-year supply to the South Coast. The Urban Delta Exporters preference set restricted land fallowing to no more than 400 TAF at the source, resulting in about 230 TAF net received. The three scenarios associated with agricultural preference sets resulted in no land fallowing options. Urban In-Delta and Unconstrained scenarios fall in the middle, each with about 150 TAF of water supplied to the South Coast from land fallowing options.

Costs for the scenarios include amortized capital and O&M of supply measures, plus estimated retail cost components for treatment, distribution, and administrative overhead. Most options provide water in more than just dry years. For example, WUE provides water savings in every year; surface storage provides a pattern of yield depending on operational rules. The estimation or source of unit costs for each option was described in Chapter 5. Based on these estimates, the total dry-year cost of a scenario is the unit cost times the dry-year quantity of each option, summed over the measures included.

Retail costs of the scenarios range from about $1,737 million for the Unconstrained scenario up to about $2.1 billion for the Urban Delta Exporters and Environmental scenarios. Marginal costs of new supplies are highest for the Urban Delta Exporters scenario as a result of costs and water losses from higher levels of membrane treatment, and because urban WUE measures are not included.

Based on these results, initial common components of a water supply program for the South Coast could include: a minimum of 200 TAF of urban recycling, 330 TAF from South Delta improvements and Colorado River options, and 100 TAF of Colorado River agricultural WUE purchased for urban use. Active conjunctive use, land fallowing, surface storage projects, and additional urban WUE and recycling are also among the low-cost options for most of the scenarios; these could be implemented as part of the long-range plan.

8.1.2 San Francisco Bay Region

The quantity of new water demanded under different scenarios is less than 250 TAF, or less than one seventh of the new water demanded in the South Coast. Water reuse makes up about half of the new supplies, and urban WUE accounts for another 25 percent of supplies in every scenario. The variation of mixes of other new supply measures is large, with some options playing a major role in some scenarios and not appearing at all in others (Figure 8-2). For example, active conjunctive use and surface storage projects comprise well over 25 percent of the supply in the Urban Delta Exporters scenario, but do not appear at all in the least cost mix for the Delta Agriculture scenario.

Scenario costs for this region include estimates of local treatment, distribution, and administrative overhead. Retail costs range from $181 to $210 million in a dry year. The lowest cost scenarios are the Unconstrained, Environmental, and San Joaquin Valley Agriculture. Delta Agriculture has the highest cost, primarily due to the use of high-cost urban WUE and recycling options.

Initial common components of a program for the San Francisco Bay Region could include a minimum of 50 TAF from urban recycling and the remainder from a variable mix of additional WUE and recycling, South Delta improvements, conjunctive use, land fallowing, and surface storage.

8.1.3 Sacramento River Region

The Sacramento River Region is evaluated here as an irrigation demand region. Only two scenarios indicate available options that are affordable for the Sacramento River Region: the Sacramento Valley and San Joaquin Valley Agricultural users. In both scenarios, the preference set prescribes that water from new supply measures be made available at current contract rates rather than at marginal cost. As a result, the scenarios provide between 235 and 255 TAF of dry-year supply. As Figure 8-3 illustrates, surface storage and active conjunctive use are the dominant options. Total dry-year cost of the options is estimated at $46 to $62 million. Most of the difference between the two preference sets in Figure 8-3 involves the amount of local conjunctive use.

No common water supply components exist across all preference sets.

8.1.4 San Joaquin River Region

The San Joaquin River Region is evaluated here as an irrigation demand region. As shown in Figure 8-4, the agricultural users' preference sets resulted in the most water supply. As described for the Sacramento River Region, pricing assumptions account for the relatively large amount of supply provided under the Sacramento and San Joaquin Valley Agriculture

Figure 8-1
New, Dry-Year Supply by Scenario
South Coast Demand Region

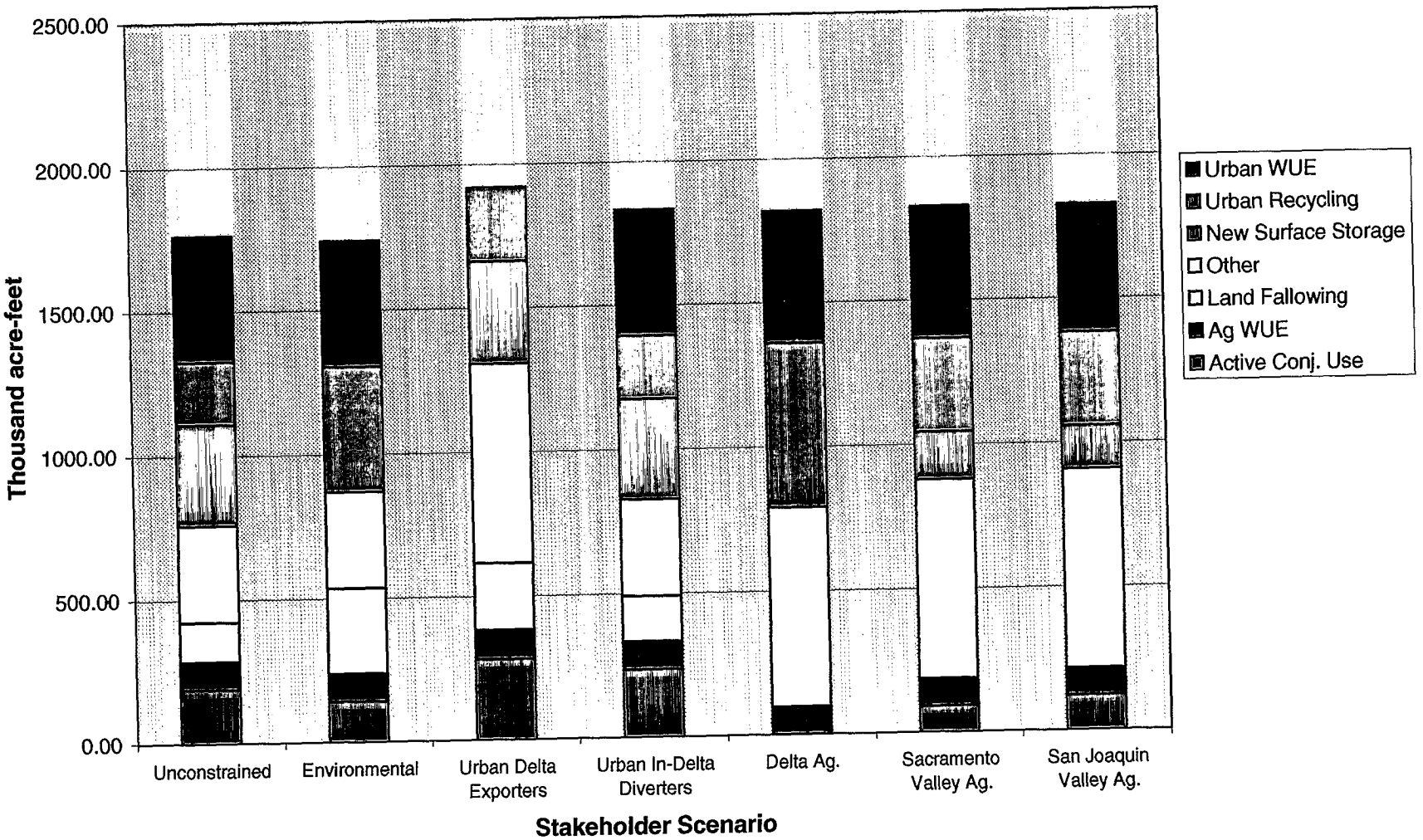

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Figure 8-2
New, Dry-Year Supply by Scenario
San Francisco Bay Demand Region

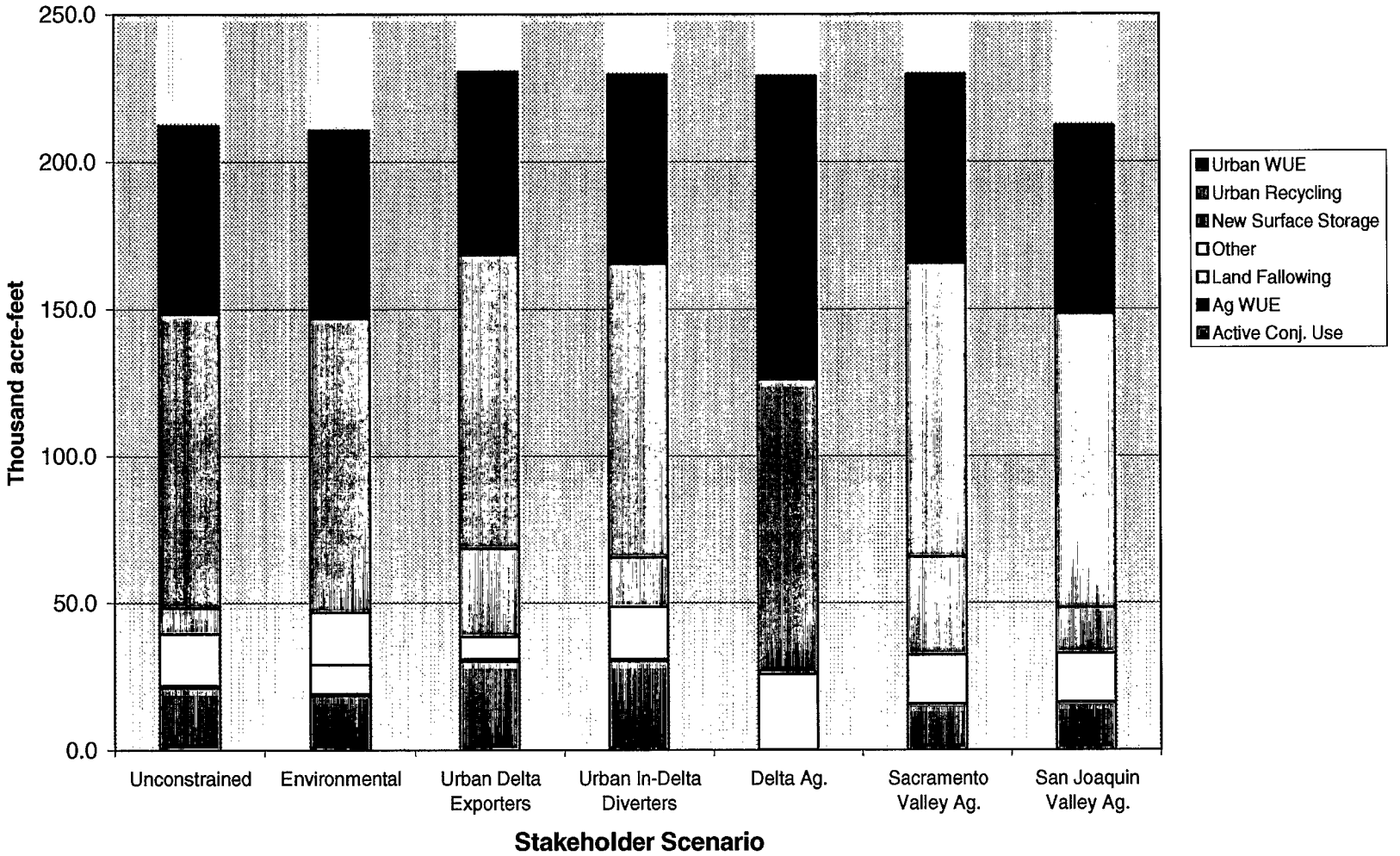

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Figure 8-3
New, Dry-Year Supply by Scenario
Sacramento River Demand Region

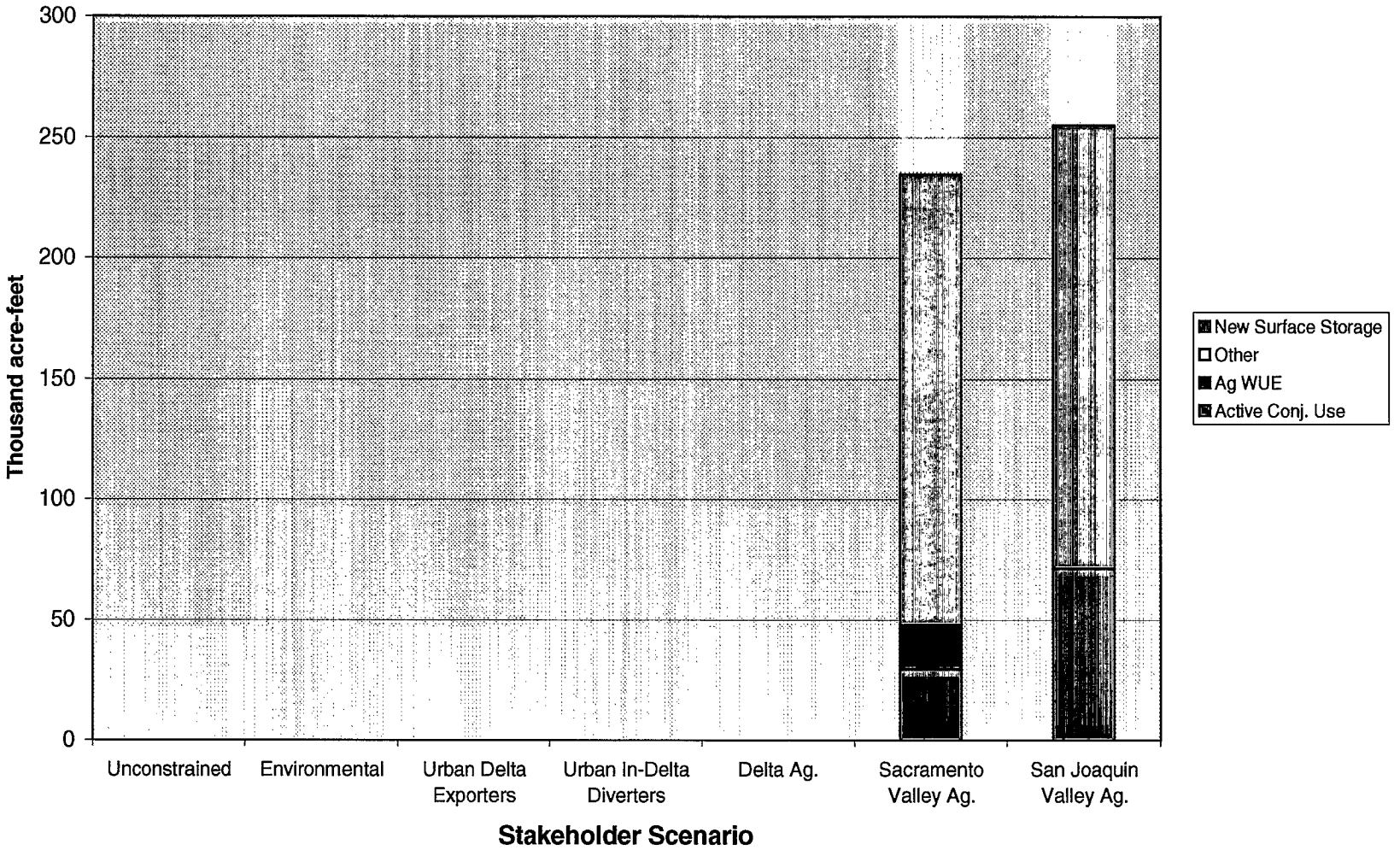

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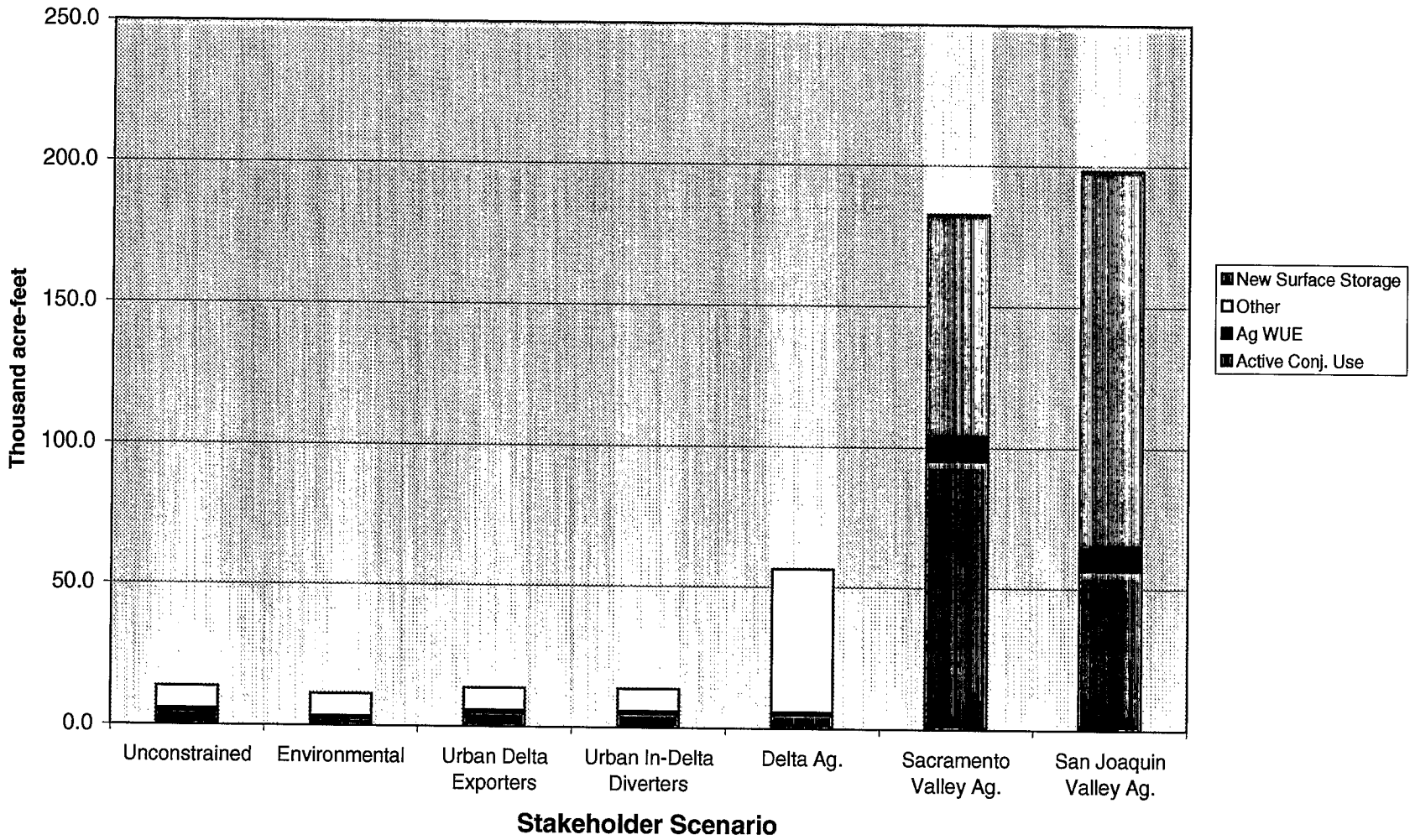
Figure 8-4
New, Dry-Year Supply by Scenario
San Joaquin River Demand Region



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scenarios: 180 to 200 TAF in a dry year. Active conjunctive use and surface storage are the predominant options. Annual costs in the dry year for the two agricultural preference sets range from $87 to $119 million. New water supply must be priced significantly below its average cost to support this level of new supply. The average cost of new supply under these two scenarios would be $475 to $600 per acre-foot, of which $45 per acre-foot would be paid by agricultural users.

Small amounts (less than 20 TAF) are provided by most of the other scenarios. The relatively high cost of available supply measures restricts their affordability. Annual cost in the dry year is less than $2 million. Average cost of new water supply would be about $125 per acre-foot.

Only those small amounts of water supply measures are common across all preference sets.

8.1.5 Tulare Lake Region

The Tulare Lake Region results (Figure 8-5) are similar to those for the San Joaquin River Region except that substantial supply from active conjunctive use is affordable. The two agricultural scenarios with price subsidies provide significantly greater dry-year supply, at up to 960 TAF. Surface storage and active conjunctive use provide over 90 percent of the supply. Total annual, dry-year cost is estimated to be about $380 million for each of these scenarios. The average cost of new supply is estimated to be about $400 per acre-foot.

Other scenarios provide active conjunctive use almost exclusively. Dry-year supply ranges up to 400 TAF. Total cost in a dry year would range up to about $50 million, or an average of about $130 per acre-foot of new supply.

Common water supply components include a minimum of about 185 TAF of active conjunctive use, 25 TAF from South Delta improvements, and a small amount (less than 5 TAF) of agricultural WUE.

8.1.6 Summary of Scenario Costs

Total, average, and marginal water supply costs for all regions and scenarios are summarized in Table 8-1. Costs for urban regions include the estimated costs for local treatment, distribution, and administrative overhead.

8.2 Uncertainty and Sensitivity Analysis

The intent of this study was to provide the best possible characterization of water management scenarios within the limits of available information and time. It is clear that all of the water option costs, quantities, and economic parameter estimates are uncertain and that resulting optimal mixes of supply and cost also are uncertain. Following are some of the important sources of uncertainty identified during this study. Uncertainty, here, means potentially inadequate information on which to base the analysis. This kind of uncertainty is assessed qualitatively or with sensitivity analyses.

More quantifiable kinds of uncertainty (also called risk) result from the existence of random future events, such as weather and the rate of population growth. These are assessed more formally as part of the parallel study, the Integrated Economic and Hydrologic Evaluation. The

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TABLE 8-1
Summary of Total, Average, and Marginal Retail Cost of New Dry-Year Supply

Region	Unconstrained	Environmental	Urban Delta Exporters	Urban In-Delta Diverters	Delta Agriculture	Sacramento Valley Agriculture	San Joaquin Valley Agriculture
South Coast							
Total Dry-year Cost (million $)	1,737	1,840	2,107	1,820	2,076	1,919	1,909
Average Supply Cost ($/AF)	984	1,056	1,097	993	1,141	1,050	1,044
Marginal New Supply Cost ($/AF)	1,045	1,142	1,561	1,057	1,609	1,601	1,265
San Francisco Bay							
Total Dry-year Cost (million $)	181	181	200	201	210	202	182
Average Supply Cost ($/AF)	854	857	868	877	918	881	858
Marginal New Supply Cost ($/AF)	1,123	1,156	1,082	1,124	1,332	1,124	1,124
Sacramento River							
Total Dry-year Cost (million $)	0	0	0	0	0	62	46
Average New Supply Cost ($/AF)						265	179
Marginal New Supply Cost ($/AF)						1,240	1,240
San Joaquin River							
Total Dry-year Cost (million $)	2	1	2	2	7	87	119
Average New Supply Cost ($/AF)	125	125	125	125	125	476	600
Marginal New Supply Cost ($/AF)	130	130	130	130	130	1,304	1,304
Tulare Lake							
Total Dry-year Cost (million $)	52	28	52	52	52	382	380
Average New Supply Cost ($/AF)	129	130	130	130	130	418	395
Marginal New Supply Cost ($/AF)	211	210	210	210	210	1,261	1,261

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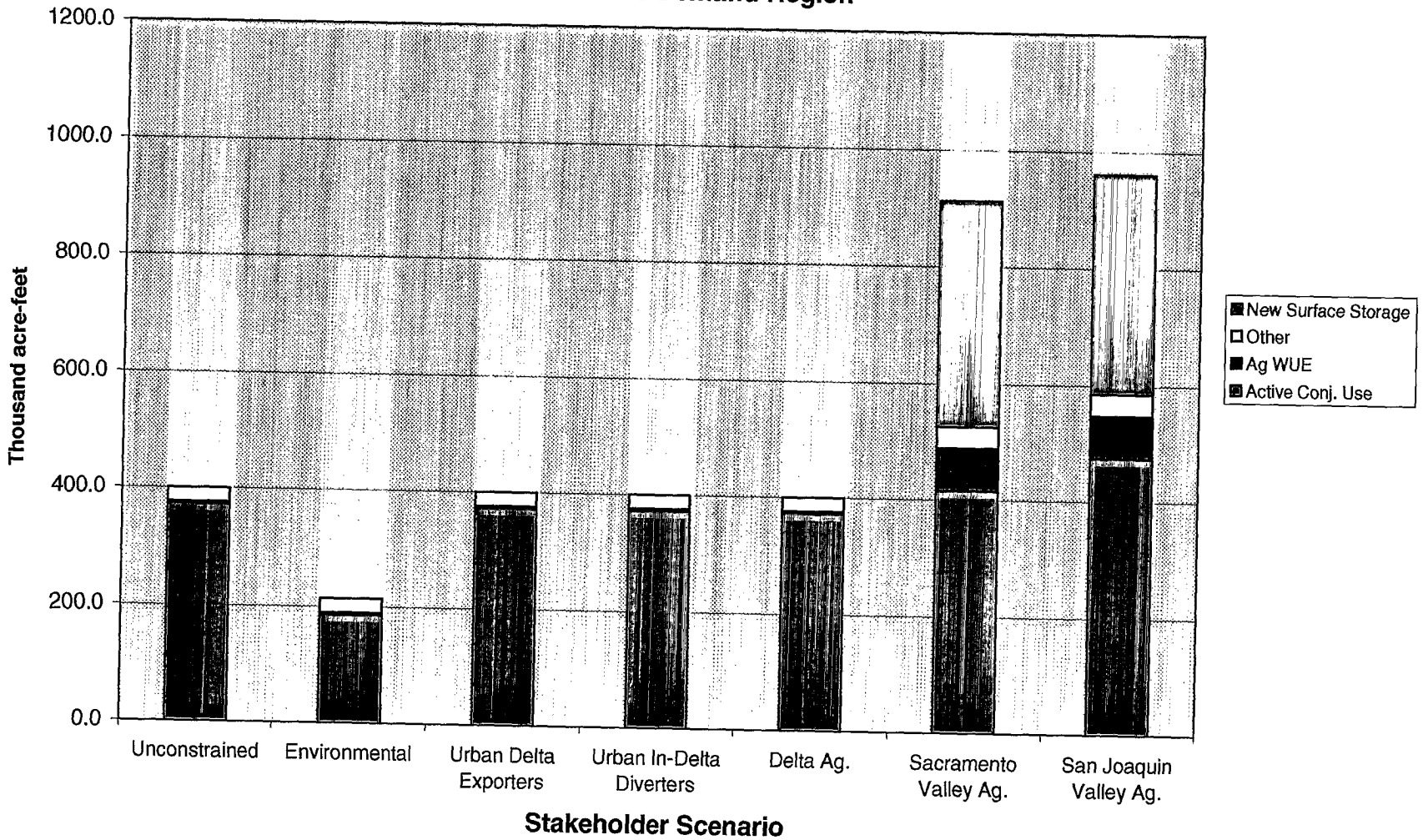
Figure 8-5
New, Dry-Year Supply by Scenario
Tulare Lake Demand Region



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Unconstrained scenario is used as the basis of the sensitivity analyses. Results for each analysis are discussed below. Demand-supply graphs for the sensitivity analyses are included in Appendix A. Figure 8-6 summarizes the results of the sensitivity analyses on water supply measures and cost for the South Coast demand region, and Figure 8-7 shows the same set of results for the San Francisco Bay demand region. Figures 8-8 and 8-9 show results of sensitivity analyses on urban demand forecasts and price elasticities of urban water demand. Water supplies for the agricultural demand regions do not change in the sensitivity analyses, except that the analysis allowing no active conjunctive use prevents all regions from using that option.

8.2.1 Unconstrained Preference Set with Isolated Facility

The isolated facility can also be viewed as a future uncertainty. It is useful to conduct the baseline analysis with the isolated facility for purposes of comparison. With the isolated facility, supply measures for municipal use passing through the Delta incur a water quality cost of $24 instead of $248. Demand-supply graphs are provided in Appendix A. The analysis below compares results to the Unconstrained scenario without the isolated facility.

In the San Francisco Bay Region, about 213 TAF of new supplies are developed, of which 50 TAF (23 percent) are recycled supplies, 51 TAF (24 percent) are urban conservation, 34 TAF (16 percent) are non-local conjunctive use, and 69 TAF (33 percent) are non-local surface storage. The remaining new supplies are from Tulare Lake Region agricultural WUE, local conjunctive use, and South Delta improvements. The total cost of screened supplies is about $163 million annually.

In comparison to the Unconstrained scenario, the San Francisco Bay Region uses less recycled supplies and urban conservation and more non-local surface storage and conjunctive use. This occurs because, without the water quality cost of $248 per acre-foot, the new surface storage water becomes relatively less expensive. Cost savings on water supplies compared to the case without the isolated facility amount to about $18 million annually.

In the South Coast Region, about 1,737 TAF of new supplies are developed, of which 109 AF (6 percent) are recycled supplies, 244 TAF (14 percent) are urban conservation, 288 TAF (17 percent) are non-local conjunctive use, 333 TAF (19 percent) are non-local surface storage, and 328 TAF (19 percent) are from land fallowing. The remaining new supplies are primarily from Colorado River sources, with relatively small amounts from local conjunctive use and agricultural conservation. The total cost of screened supplies is about $1,482 million annually, or about $255 million less than the Unconstrained scenario.

In comparison to the Unconstrained scenario, the South Coast Region uses less urban recycling and urban conservation and more conjunctive use and land fallowing. This occurs because, without the water quality cost of $248 per acre-foot, the conjunctive use and land fallowing options become relatively less expensive. Demand is increased by the smaller average price ($842 versus $1,045). This price reduction increases demand by about 20 TAF. Still, less total water is used, because brine losses are reduced by 80 TAF. Cost savings on water supplies compared to the Unconstrained scenario, including treatment cost savings, amount to about $270 million annually.

Results for the other three demand regions are identical to those for the Unconstrained scenario.

8.2.2 Market Incentive on Land Fallowing Options

The additional incentive needed to induce a reliable land fallowing program is assumed to be 100 percent. The scale of optimal water transfers from land fallowing was tested by reducing the incentive to 50 percent in a sensitivity analysis. As shown on the demand-supply graphs in Appendix A, results indicate only small changes in the mix of supply measures. In comparison to the baseline (Unconstrained scenario) with the 100 percent incentive charge, total annual cost in the San Francisco Bay Region is reduced by about $3 million. Cost in the South Coast is increased slightly. The profit incentive is only one component of the total cost of water delivered to demand regions. Delivered cost also includes adjustment for consumptive use, Delta loss, transaction costs, and transport costs.

The Delta loss factor is believed to be another reason for the relatively small effect of reducing the profit incentive (see discussion below). When the loss factor was 35 percent, few land fallowing options appeared in the screened scenarios. It is likely that several land fallowing options were close to being selected – either a reduction in the profit incentive or a reduction in the Delta loss factor would have made the difference. The small effect may also be due to the large ($248 per acre-foot) water quality cost on all Central Valley land fallowing that occurs without the isolated facility. The interaction between the Delta loss factor, profit incentive, and perhaps other land fallowing assumptions should be studied further.

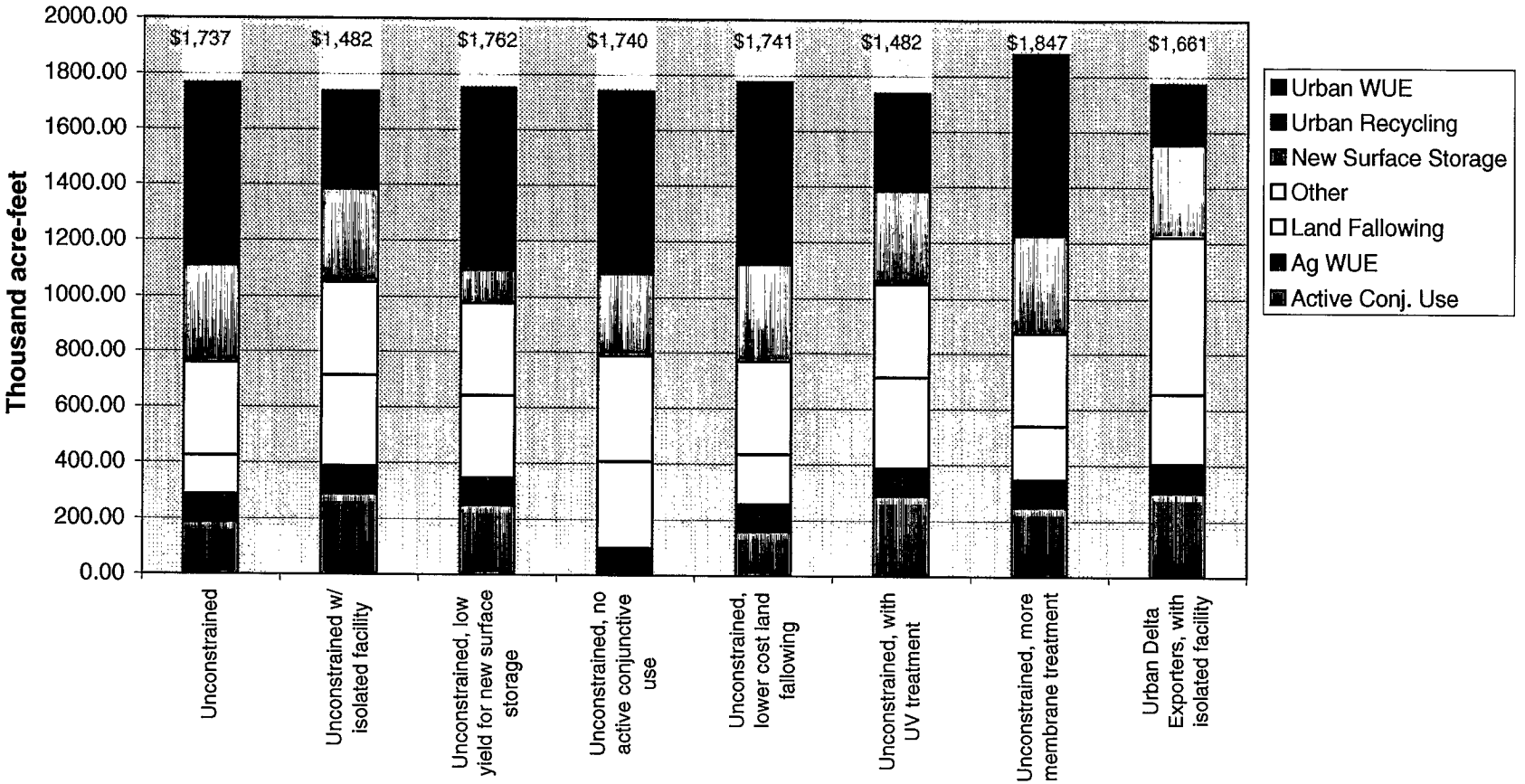
8.2.3 Delta Loss Factor for Transfers

Another significant assumption affecting the transfer of water from the north to the south of the Delta is the ratio of water developed and eligible for cross-Delta transfer to the water that can actually be transferred. The export/import (E/I) ratio specified in the Bay-Delta Accord, management of salinity, and endangered species restrictions all affect the ability to move water through the Delta. The expected loss in a dry year depends on all of these factors and their interaction with daily hydrologic phenomena. Initial analyses for this study used the E/I ratio for the July through December period as the assumed loss factor – for every acre-foot of new water entering the Delta, only 65 percent could be exported.

It was recognized that the E/I ratio should be maintained for the total quantity of water moving through the Delta, but not necessarily for every increment of water entering the Delta for export. Therefore, the 65 percent estimate was judged to be too high. Without modeling and/or operations experience with the kinds of water management options being evaluated, no one knows what the right loss factor is. After some discussion with Delta experts, a ratio of 20 percent loss (Delta outflow) and 80 percent net export was adopted. Therefore, for evaluation, all supply measures developed north of the Delta for export to the south were assumed to incur a loss of 20 percent. Exceptions were some surface storage options for which Delta modeling studies had been completed.

This assumption is important in determining the cost-effectiveness of land fallowing, conjunctive use, and other options north of the Delta. In particular, the amount of water from land fallowing options increased substantially in several scenarios when the Delta loss factor was reduced from 35 percent to 20 percent. This assumption was changed at the same time as several other demand and supply assumptions, so an exact numerical calculation of the effect

Figure 8-6
Sensitivity Analyses on Unconstrained Scenario
Total for South Coast Demand Regions
(Dry-year cost in millions shown above each bar)



Sensitivity Analysis on Unconstrained Scenario

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Figure 8-7
Sensitivity Analyses on Unconstrained Scenario
San Francisco Bay Demand Region
(Dry-year cost in millions shown above each bar)

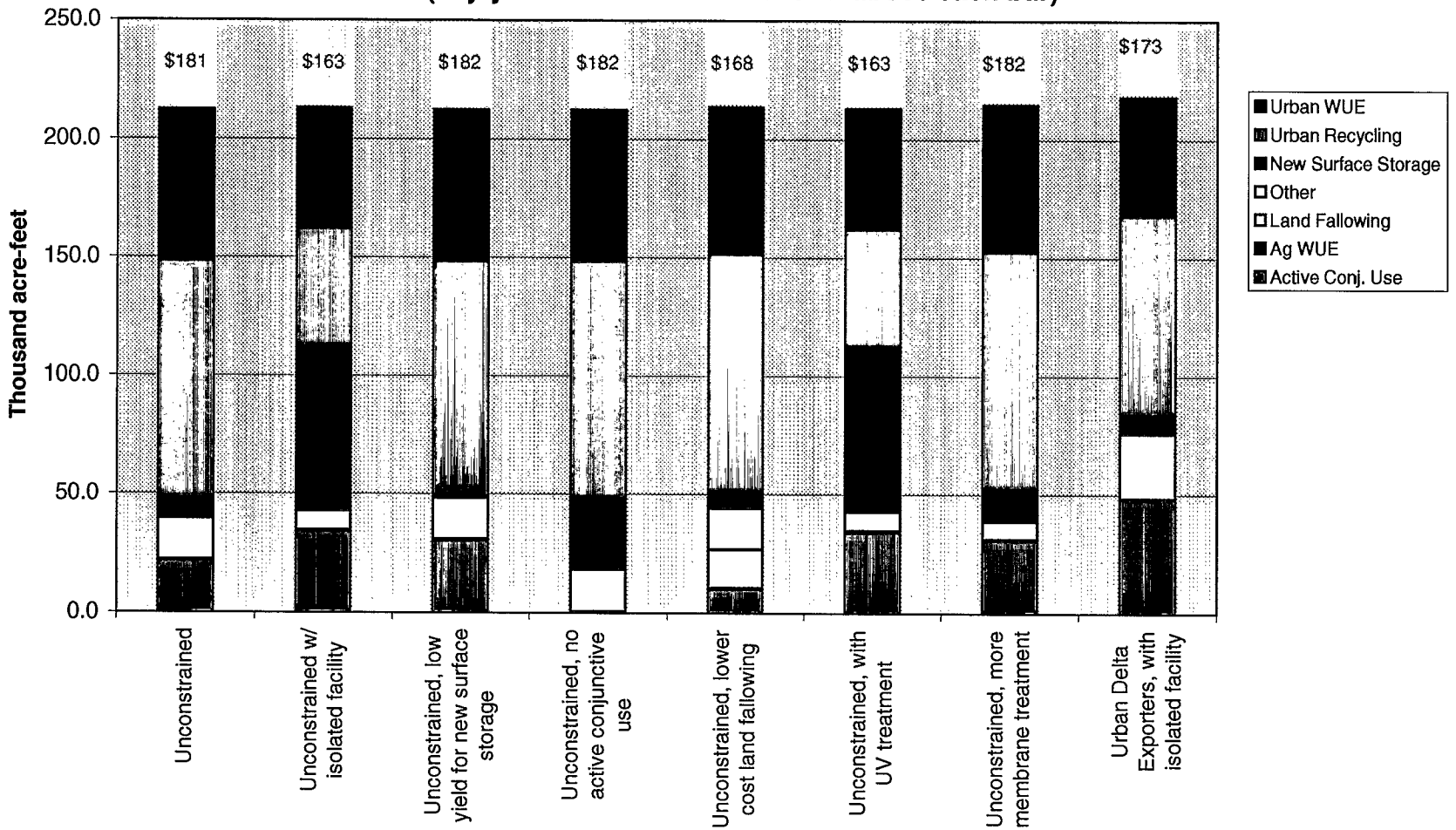

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Figure 8-8
Sensitivity Analyses on Urban Demand
South Coast Demand Region
(Dry-year cost in millions shown above each bar)

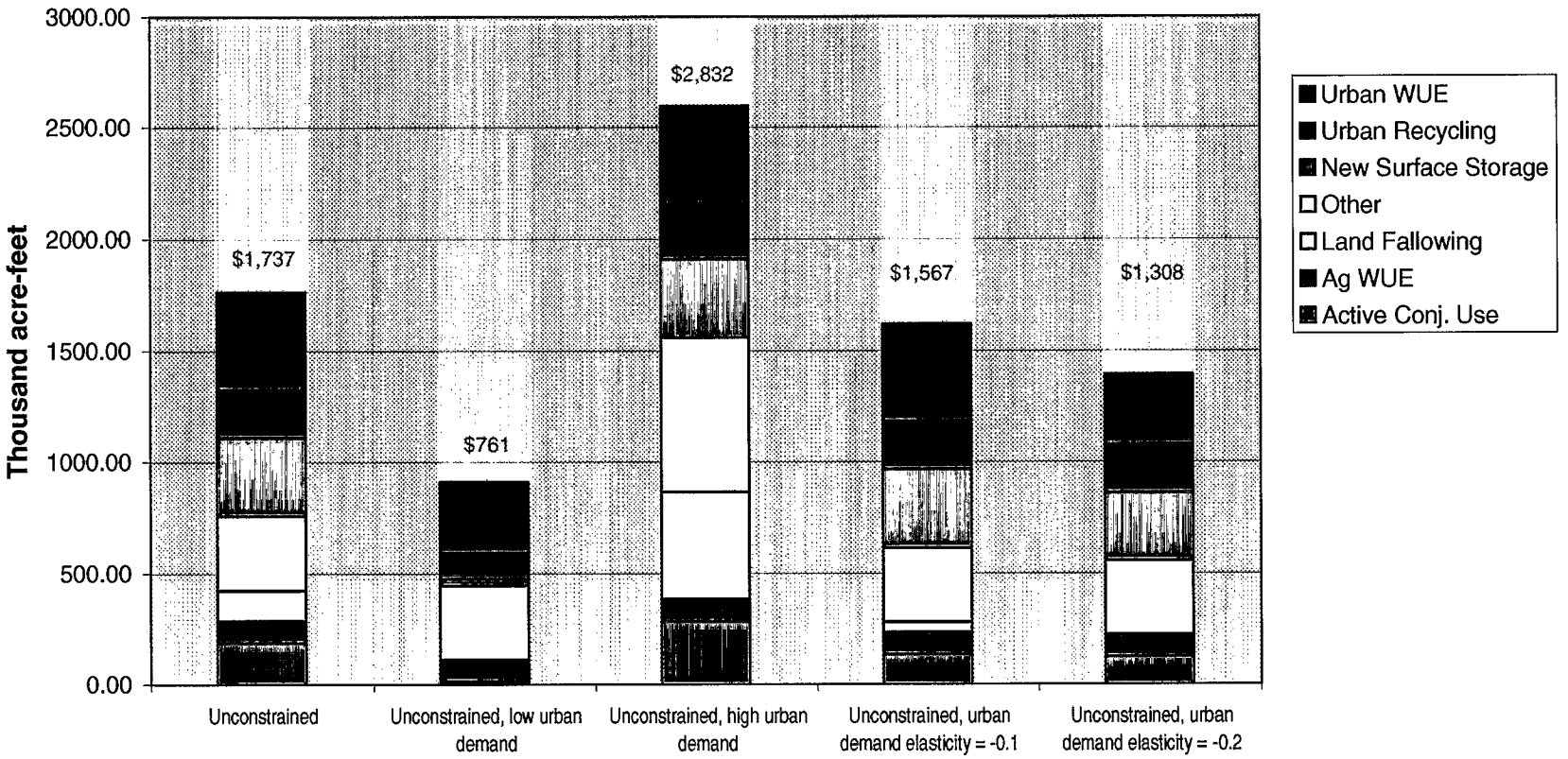

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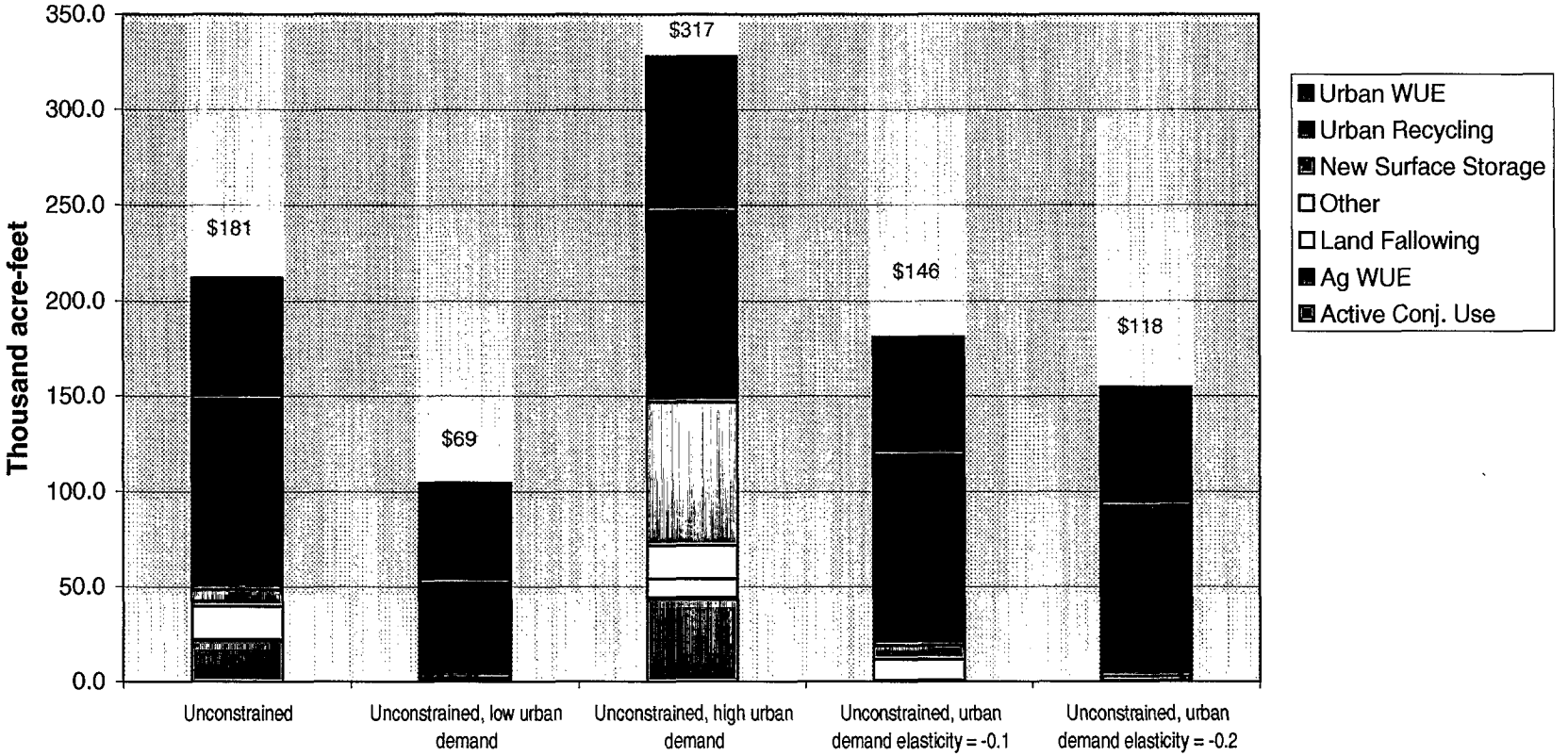
Figure 8-9
Sensitivity Analyses on Urban Demand
San Francisco Bay Demand Region
(Dry-year cost in millions shown above each bar)



Variation on Unconstrained Scenario

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cannot be made without further analysis. Therefore, no results are included in Figures 8-6 and 8-7.

8.2.4 Yield from Surface Storage

All preference sets were evaluated under assumptions that tend to result in larger surface storage water supply yields and lower costs per acre-foot. A sensitivity analysis with lower yields and higher unit costs was performed. Even with the higher unit cost, some surface storage is still economical, but the shares of urban supplies provided by surface storage are reduced by over 60 percent. In comparison to the Unconstrained scenario, the urban demand regions use more of other supplies, primarily land fallowing and active conjunctive use. Total annual costs in the San Francisco Bay and South Coast Regions are increased by about $1 million and $25 million, respectively.

8.2.5 Active Conjunctive Use Feasibility

Feasibility and cost for active conjunctive use projects are difficult to assess, because many important physical characteristics are not directly observable. Characteristics include groundwater quality, aquifer transmissivity, and specific yield. Tools needed to assess performance include groundwater modeling and demonstration projects. The use of local groundwater basins to manage statewide water resources is also a highly political topic that can add costs and limit the scale and scope of potential projects.

A sensitivity analysis with no conjunctive use was conducted. In comparison to the Unconstrained scenario, the urban demand regions replace the lost supply with other measures, primarily land fallowing and other local projects. Total annual costs in the San Francisco Bay and South Coast Regions are increased by less than $1 million and $3 million, respectively.

8.2.6 Membrane Treatment Cost Sensitivity Analysis

The water supply costs used in the preference sets assumed membrane treatment for urban water supply using a preliminary assessment of 2020 water quality standards and membrane treatment needs. This assessment was detailed in Section 6.4.2. Subsequent to that assessment, more detailed information about the potential amount and costs of membrane technology in the South Coast Region was obtained from Metropolitan. The new information estimated that 1.951 MAF of membrane treatment capacity would be needed in 2020 to meet water quality requirements. Capital costs would amount to $308 annually per AF of capacity, and additional variable costs per AF actually treated would be $209. The sensitivity analysis that includes this information in the Unconstrained preference set is shown in Appendix A, Charts 56 through 60. There are three types of important economic effects in comparison to the Unconstrained preference set. First, the average cost of water is higher because of the additional cost of membrane treatment capacity. Second, the demand for new supplies is increased by the additional brine loss. Third, the relative benefit of Delta water supplies is increased because variable treatment costs are reduced from $248 per AF to $209.

Overall, marginal costs are slightly affected in comparison to the Unconstrained preference set. In the South Coast, the increased membrane treatment brine losses and lower variable costs result in nearly identical marginal retail water costs ($1,042 and $1,045) at the demand-supply

equilibrium. Demand for new supplies is increased by about 115,000 AF. This increase includes about 107,000 AF from land fallowing, mostly from the Sacramento River Region, used to meet the South Coast demand.

San Francisco Bay Region demands and supplies are slightly affected. Marginal cost and average cost are reduced slightly (2 to 4 percent) in comparison to the Unconstrained preference set. The amount of new supplies is increased by about 2,000 AF.

8.2.7 Ultraviolet Radiation Treatment Cost Sensitivity Analysis

This sensitivity analysis considers the effects of UV radiation treatment technology on the selection of water supplies. The scenario assumes that UV technology is proven feasible and is adopted to meet 2020 water quality standards. Membrane technology is not required. Costs of UV technology are currently unknown, but it is believed it would be relatively inexpensive. Costs are assumed to be equal to those of ozone treatment, which are $27 per AF of capacity plus $24 per AF actually treated.

Results are shown in Appendix A, Charts 61 through 65. This scenario shows the lowest average cost for new urban water supplies of any preference set or sensitivity analysis. With no brine loss, the amount of new supplies tends to be reduced in comparison to the Unconstrained preference set, but lower water costs tend to increase demand. The net effect is that the amount of new supplies used is about the same, but marginal and average costs are both reduced substantially. In the San Francisco Bay Region, marginal and average cost at retail are reduced 25 and 8 percent, respectively. In the South Coast, the corresponding reductions are 19 and 11 percent, respectively.

8.2.8 Urban Delta Exporters Preference Set with Isolated Facility

This analysis includes the isolated facility along with the other preferences of the Urban Delta Exporters set. Some Urban Delta Exporters have expressed a preference for an isolated facility as part of their preference set. The facility was not included in their preference set analysis, because it is not considered a water supply option and because it is not consistent with current CALFED principles and policies.

The most important operative preferences, other than the isolated facility, are the higher level of membrane treatment and the exclusion of additional urban water conservation beyond baseline 2020 levels as established by existing urban BMPs. This latter preference is based on a belief that additional conservation is not economically feasible.

Results are shown in Appendix A, Charts 66 through 70. In comparison to the Unconstrained preference set, results reflect a mix of increased marginal costs due to loss of conservation options and reduced average costs caused by membrane treatment cost savings. The amount of water used is very close to the Unconstrained amount in both urban regions. Average costs are lower in both regions, but marginal costs are higher in the South Coast Region and lower in the San Francisco Bay Region. The higher marginal cost in the South Coast Region is caused by the loss of conservation options. The lower marginal cost in the San Francisco Bay Region is caused by variable treatment cost savings.

Compared to the Urban Delta Exporters scenario (without isolated facility), 160 TAF less water would be used in the dry condition, and the dry-year cost of new water supplies would decline by about $450 million. These changes largely reflect reductions in membrane treatment.

8.2.9 Urban Demand Elasticity Sensitivity Analysis

Urban demand elasticity was an important technical issue for many stakeholders. Some stakeholders felt that the 2020 urban demand elasticity selected for the analysis, -0.042, was too small. Arguments put forth in favor of a more elastic demand involved relationships between price, water saving options, changing technology, and water use. A sensitivity analysis was developed to consider the effects of more elastic demand on the amount and costs of water. Elasticities of –0.10 and –0.20 were considered.

Results are shown in Appendix A, Charts 71 and 72, and are compared to the Unconstrained scenario results in Figures 8-8 and 8-9. The more elastic demands reduce the amount of water demanded, the amount of new water developed, and the marginal and average costs of water at the demand-supply equilibrium. Consumers are more responsive to the higher prices caused by the new water supplies. In the San Francisco Bay Region, at the elasticities of –0.042, -0.10 and –0.20, the use of new supplies is 212.3, 181.0, and 154.6 TAF, respectively. In the South Coast Region, the corresponding water quantities are 1,764, 1,621 and 1,395 TAF, respectively. The differences between the amounts of new water supply would be substantially reduced if average cost pricing were used instead of marginal cost pricing.

8.2.10 Urban Demand Forecast Sensitivity Analysis

Following the first draft of this screening analysis, many comments were received regarding the basis for water supply and demand forecasts to 2020. Some comments took exception to the demand forecasts, while others took exception to the forecasts of local and imported supplies. The intention of the EEWMA dry-year analysis was to represent a 1-in-5 five year condition; more formally, the average of water supplies delivered in the driest 20 percent of years.

Several sources of information for SWP and local supplies in the South Coast were reviewed. Annual SWP supply forecasts for the 1 in 5 condition ranged from about 1.1 to 1.4 MAF on average. For local supplies, Bulletin 160-98 2020 average and drought condition supplies, exclusive of SWP supplies, are 3.276 and 3.511 MAF, respectively. The drought condition supplies, which are intended to be for a 1-in-20 year, are more than the averages, because groundwater and local imports are increased somewhat to meet increased demand and to make up for the loss of SWP and local surface water. Some stakeholders disagreed with these 160-98 local supply estimates, and alternative projections were provided.

A sensitivity analysis was developed to consider a range of reasonable urban water demand and supply forecasts. Table 8-2 shows the calculations used to estimate the range. Urban demand was allowed to range 3 percent above and below the baseline forecast to accommodate uncertainty in population growth. Uncertainty about the efficacy of South Coast urban drought conservation programs in the future was handled as a 5 percent demand reduction. Future supply forecasts were obtained from DWR and Metropolitan; a range of 3 percent above and below the baseline was assumed if no alternative forecasts were available. This range of forecasts is believed to be reasonable.

From Table 8-2, the need for new supplies in the San Francisco Bay Region was estimated to vary by plus or minus 120,000 AF. In the South Coast Region, a reasonable range appeared to be plus or minus 900,000 AF. To determine the net effect on the types of new supply options acquired to 2020, this range was introduced into the economic demand functions in the screening analysis. No specific probabilities have been attached to any potential outcomes within or outside of the range.

Results are shown in Appendix A, Charts 73 and 74, and are compared to the Unconstrained scenario results in Figures 8-8 and 8-9. In the San Francisco Bay Region, the amount of new supplies taken could range from 105 to 328 TAF. Marginal retail cost could range from $862 to $1,162 per acre-foot, and average cost could range from $795 to $845. In the South Coast Region, the amount of new supplies taken could range from 910 to 2,596 TAF. Marginal retail cost could range from $921 to $1,242 per acre-foot, and average cost could range from $727 to $853. These ranges, both in quantity and cost, encompass nearly the entire range of results from all other preference sets and sensitivity analyses.[1] This suggests that differences between forecast and actual demands and supplies could result in larger differences in 2020 water use and costs than any differences caused by factors specified in the preference sets.

8.2.11 Other Uncertainties

Other assumptions and water supply measures have some level of uncertainty associated with cost estimates, supply estimates, or physical and institutional feasibility. Other frequently discussed uncertainties are summarized below.

Cost of environmental mitigation. This category of cost is associated primarily with surface storage development, but it also applies to active conjunctive use projects and other options having a physical impact on the environment. Mitigation costs have been included in cost estimates for surface storage, but disagreement remains about whether the estimates are accurate.

New technology. All costs in this study are based on demonstrated technology. Potential advances in cost-saving technology could affect the feasibility of WUE and recycling options, in particular. New urban WUE technologies available to water users could partly offset the effect of demand hardening.

Hydrology and water supply. Estimated yields of some supply measures are based on hydrologic models that use historical hydrology. Future hydrology may differ from the past in ways not currently foreseeable.

8.2.12 Baseline Assumptions on Environmental Water Acquisition

CVPIA PEIS Alternative 4 was used to represent the future with water reallocation and acquisition. At the time the assumption was made, CALFED hydrologic analysis of ERP water acquisition was not complete. The level of acquisition and reallocation affected agricultural water supply most and thus had an important influence on the agricultural supply and demand estimates used in this study. For example, in the baseline, the San Joaquin River Region had

[1] One important exception is that the availability of UV technology reduces marginal and average costs below the costs for the low-demand scenario.

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TABLE 8-2
Development of Sensitivity Analysis of Water Needs. Demand and Supply Forecasts for the 1 in 5 Condition (Range of Uncertainty in Population Levels is 3 Percent[a])

	EEWMA Forecast	Source of EEWMA Data	Supply Maximizing Forecast	Source of Need Maximizing Forecast	Supply Minimizing Forecast	Source of Need Minimizing Forecast
South Coast Region						
Result: 2020 Potential Demand for New Supplies	**1,891**		**2,830**		**996**	
2020 Demand, TAF[b]	**5,979**		**6,158**		**5,383**	
Demand, no drought conservation	5,979	160-98 avg + 4% for dry	6,158	EEWMA plus 3%	5,667	160-98 minus 3%
Drought conservation	0		0		283	Five percent
2020 Urban Supplies, TAF	**4,088**		**3,329**		**4,387**	
SWP supplies	1,226	Run 675 critical period	1,005	Run 675 avg of driest 20%	1,354	Bulletin 160-98
Recycled water	273	Bulletin 160-98	265	160-98 minus 3 %	361	Met
Local groundwater	1,380	Bulletin 160-98	1,339	160-98 minus 3 %	1,498	Met
Reapplication of GW and SW	454	Bulletin 160-98	304	9% of supplies, not recycled	454	Bulletin 160-98
Local surface water	140	Bulletin 160-98	128	Met	144	160-98 plus 3 %
Other imported water	554	Bulletin 160-98	248	Met	571	160-98 plus 3 %
Colorado River Aqueduct[c]	656	Bulletin 160-98	656	Bulletin 160-98	656	Bulletin 160-98
Other (Env flows later captured)	55	Bulletin 160-98	55	Bulletin 160-98	55	Bulletin 160-98
2020 Supplies, TAF	4,738		3,999		5,093	
Minus non-urban demands	570	Bulletin 160-98	570	Bulletin 160-98	570	Bulletin 160-98
Minus brine loss	80	Ten % of 800 taf	101	Ten % of SWP	135	Ten % of SWP
San Francisco Bay Region						
Result: 2020 Potential Demand for New Supplies	**239**		**392**		**122**	
2020 Demand, TAF	**1,317**	Bulletin 160-98 average	**1,397**		**1,247**	
Demand, no drought conservation	1,428	Bulletin 160-98 dry	1,471	160-98 plus 3%	1,385	160-98 minus 3%
Drought conservation	111	Assumed the difference	74	Five percent	139	Ten percent

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TABLE 8-2
Development of Sensitivity Analysis of Water Needs. Demand and Supply Forecasts for the 1 in 5 Condition (Range of Uncertainty in Population Levels is 3 Percent[a])

	EEWMA Forecast	Source of EEWMA Data	Supply Maximizing Forecast	Source of Need Maximizing Forecast	Supply Minimizing Forecast	Source of Need Minimizing Forecast
San Francisco Bay Region						
2020 Urban Supplies, TAF	**1,078**		**1,005**		**1,125**	
SWP/CVP supplies	403	Run 675 critical period	364	Run 675 avg of driest 20%	436	Bulletin 160-98
Recycled water	37	Bulletin 160-98	36	160-98 minus 3 %	38	160-98 plus 3%
Local groundwater	84	Bulletin 160-98	81	160-98 minus 3 %	87	160-98 plus 3%
Reapplication of GW and SW	3,022	Bulletin 160-98	3,022	Bulletin 160-98	3,022	Bulletin 160-98
Local surface water	270	Bulletin 160-98	262	160-98 minus 3 %	278	160-98 plus 3%
Other imported water	515	Bulletin 160-98	500	160-98 minus 3 %	530	160-98 plus 3%
Other	1,179	Bulletin 160-98	1,179	Bulletin 160-98	1,179	Bulletin 160-98
2020 Supplies, TAF	5,510		5,444		5,570	
Minus non-urban demands	4,402		4,402		4,402	
Minus brine loss	30		36	Ten % of SWP/CVP	44	Ten % of SWP/CVP

[a] In South Coast, 3% is about 730,000 persons out of 24.3 million. In Bay area, 3% is about 210,000 persons out of 7 million
[b] All demand forecasts include an adjustment for location of 230 TAF
[c] EEWMA allows additional Colorado yield to be an option up to 1.1 MAF

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already lost water to reallocation and sold water for environmental uses. Now that CALFED ERP analysis has been completed, a re-estimate of agricultural supply and demand will be undertaken. The Integrated Economic and Hydrologic Evaluation will use the latest estimates of water supply and acquisition available.

8.2.13 Colorado River Options

Sufficient options are assumed to be available and of reasonable cost to allow the South Coast demand region to continue using the Colorado River Aqueduct at historical levels. All preference sets use Colorado River measures to the capacity of the Colorado River Aqueduct.

8.2.14 Operational Feasibility

No comprehensive assessment has been made in the screening evaluation of the ability of the physical and institutional water system to store and move water in the patterns suggested by the scenarios. That assessment will be the task of the Integrated Hydrologic and Economic Modeling Analysis.

8.3 Subsidies

The Sacramento Valley Agriculture and San Joaquin Valley Agriculture scenarios include a preference that water from supply measures be made available to compensate for, or replace, water supply reallocated over the last decade. As replacement water, it would be charged at existing contract rates for irrigation. Because all of the water supply measures evaluated cost substantially more than could be recovered using existing rates, this preference results in a significant cost that must be recovered through other means. This study does not propose ways to recover the cost, but provides an estimate of the necessary amount. The term subsidy is used here to indicate that costs that would, by standard practice, be allocated to the beneficiary group are, instead, being paid by some other, unspecified group.

Existing contract rates used for this evaluation are based on typical rates for CVP and SWP irrigation water delivered to the likely service areas. In the Sacramento River Region, the CVP Tehama-Colusa Canal Service Area is assumed to be the delivery point. Under pricing guidelines established by CVPIA, most water is priced at the so-called cost-of-service rate. The last 20 percent of contract delivery steps up in two increments to the higher "full-cost" rate. Within this service area, cost-of-service rates range between $15 and $25 per acre-foot plus a restoration charge of about $7 per acre-foot (Reclamation, 1998). Most full-cost rates, after adding the restoration charge, range between $35 and $45 per acre-foot. Water supplied in this evaluation is likely to be split among the water rate tiers; for purposes of analysis, an average rate of $30 per acre-foot is used.

In the San Joaquin River Region, the Delta Mendota and San Luis service areas are the assumed recipients of water. Using the range of appropriate water rates from Reclamation (1998), an average rate of $45 per acre-foot is used. For the Tulare Lake Region, Westlands Water District and SWP contractors in Kings and Kern Counties are the assumed recipients. An average price of $60 per acre-foot is used.

The prices used are not intended to be precise calculations of weighted average contract rates. Rather, they are representative prices that provide an estimate of the subsidy needed to supply relatively high-cost replacement water.

Two scenarios included an implicit subsidy for irrigation water: Sacramento Valley Agriculture and San Joaquin Valley Agriculture. Of the estimated $46 to $62 million in cost of water for the Sacramento River Region, payment for water would be about $7 to $8 million, resulting in a subsidy of $38 and $55 million.

Costs of water supply measures to the San Joaquin River Region range from $87 to $119 million in the two scenarios with subsidies, with repayment of about $8 million. In the Tulare Lake Region, costs range from $380 to $382 million in the same two scenarios, with repayment estimated at $56 and $58 million.

8.4 Other Impacts of Supply Options

This study has focused on quantifiable costs associated with yields of water from different supply or demand management options. Numerous other important, and in some cases overriding, considerations must be weighed as the CALFED water management program develops. Clearly, water quality effects must be incorporated in the analysis. Salinity management is an important problem in the South Coast Region. Some quantitative approaches exist to bring at least some water quality issues into the formal cost screening.

Environmental impacts of all options must be considered, both in the aggregate in a programmatic environmental assessment and at the time specific water-supply measures are selected and developed. The economic analysis has been limited to costs or benefits that are readily quantified. Non-market values of natural resources must be considered if not quantified.

Water quality has been discussed already as a critical factor in both the cost and feasibility of a water management solution. Sufficient information exists to include water quality effects and costs in an expanded quantitative analysis of water management scenarios.

Several of the options and scenarios considered here can affect power production and consumption. Obviously new storage or re-operation of existing storage will affect power generation. In addition, many options can affect power use, such as active conjunctive use, water recycling, and desalting.

8.5 Uncertainty and the Ranking of Options

Results of this analysis suggest that the supply curve of water supply measures is relatively flat over the initial range. This implies that large retail water cost increases should not be necessary to pay for new water supplies. With average cost pricing, retail price increases needed to pay for new urban water supplies are small: just a few percent or less under almost all preference sets.

The relatively flat supply curve occurs because a large number and multiple types of water supply measures are available within a small price range. Often, the cost differences among water supply measures are not significant, given the inherent uncertainty in the cost estimates.

Therefore, greater resolution in costs in the form of improved cost estimates would be needed to clearly differentiate economically preferred supply measures. The small differences in cost among many options is a key result of this evaluation; it indicates that, within limits, a flexible, broad-based approach to water management can be pursued without substantial cost variations. These small differences may also justify allowing other criteria, such as environmental or economic impacts, to play a larger role in selecting a preferred water management program.

Chapter 9

Next Steps

9. Next Steps

The screening analysis presented in this report is a first step toward evaluating the costs of different combinations of water supply and demand options. As discussed several times in earlier chapters, numerous improvements to both data and analytical approach are necessary before decisions can be made or resources committed. This chapter describes some of the most important next steps identified by stakeholders and the CALFED EEWMA staff.

9.1 Water Projects Operations

The CALFED Integrated Economic and Hydrologic Investigation (a detailed modeling effort) is difficult and complex. Its results may not be available for some time. An interim next step will be the development of a screening hydrologic methodology to assess the EEWMA scenarios. Sample issues include how Delta conveyance limits the quantities available from supply options north of the Delta and storage south of the Delta and whether there is sufficient excess flow to operate all options simultaneously when a scenario has multiple storage options (conjunctive use or new surface).

A relatively simple spreadsheet-format water project operations model will be used to screen the EEWMA scenarios. The spreadsheet model will address multiple year hydrology and Delta operations. A DWRSIM run will be used to represent current project operations and to provide boundary conditions and input to the spreadsheet model. Complex surface-groundwater interactions will be addressed later in the more sophisticated integrated model.

9.2 Refined Cost and Quantity Estimates for Water Supply Options

The EEWMA screening analysis used available information (Table 5-1, *Supply Data at Source*) for water supply option costs and quantities. This information is relatively uncertain for several of the supply options. The water project operations model mentioned above will be used to refine supply quantities for new surface storage and active conjunctive use projects. There are also several ongoing programs addressing water supply project costs and quantities, such as Reclamation's CVP Yield Feasibility Investigation, DWR's Bulletin 160 activities, and CALFED's Integrated Storage Investigation. Refined cost information from these other programs will be incorporated as appropriate.

9.3 Water Quality Effects on Water Supply Quantity and Costs

The EEWMA was limited to a least-cost water supply analysis and did not provide a detailed analysis of water quality effects on water supply quantity and costs. CALFED Stage 1 water quality measures may utilize some new supply. The water project operations

model mentioned above will be used to estimate these effects. Also, the EEWMA identified new technology that could significantly affect the treatment costs required for new water supplies. The status of this technology will updated.

9.4 TDS Analysis for South Coast Demand Region

Some Delta water supplies are blended with Colorado River supplies in the South Coast Region to achieve salinity goals. Final water supply salinity affects appliance and fixture replacement and maintenance costs, ability to recycle water, and groundwater management. A simple spreadsheet TDS model will be used to analyze these costs resulting from different amounts of Delta water supply. Avoided costs associated with salinity of South Coast water supply will be identified.

9.5 Refined Environmental Water Supply Quantities

The EEWMA screening analysis assumed that future environmental water need is equivalent to the need described in the CVPIA PEIS. CALFED is pursuing several activities, including the Environmental Restoration Program and the Environmental Water Account, that will further define future environmental water supply quantities. These environmental water quantities should be integrated with future agricultural and urban demands. The total amount and uncertainty of environmental water supply quantities will be estimated. New water supply allocation criteria integrating environmental needs will be developed. The environmental water supply can be either acquired from willing sellers or subsidized as a share of a new water supply project. The total environmental need will be divided into increments, and the screening analysis will be conducted for each increment. The cost of environmental water and the resulting impacts to agricultural and urban water supply (cost and quantity) will be estimated.

9.6 Expanded Regional Economic Impacts Analysis

The EEWMA screening analysis estimated the regional economic impacts resulting from land fallowing. An expanded analysis will include both adverse and beneficial regional impacts associated with water supply and use, construction activities, recreation, municipal and industrial activity, and power production. In addition to land fallowing, the other water supply options that are part of a scenario will be evaluated. Analytical tools used in this analysis will include input-output economic models, case studies, and other tools, as appropriate.

9.7 Cost Allocation Strategies

Implementation of water management options will require a specific method for financing projects and recovering state and federal investments. Cost allocation strategies could vary from option to option and might include subsidies. Cost allocation would also vary by stakeholder preference sets. In the EEWMA criteria for cost allocation, water allocation, and pricing were explored (Table 3-1, *Summary of Stakeholder Preference Sets*). Further refinement of cost allocation will include additional specific input from the stakeholders and definition

of unconstrained assumptions. Since the EEWMA analysis is based on a user's willingness to pay, subsidies affect the selected options in each scenario. Changing cost allocations can cause a particular option type or measure to be included or excluded. Implications regarding financing options (State and federal funds, user fees, bonds, etc.) and repayment will also be explored.

9.8 "Practicability" and Local Interests Inventory

Implementation of many of the water management options will require a CWA 404 permit. The notion of "practicability" must be addressed in that permitting process. The U.S. Environmental Protection Agency and U.S. Army Corps of Engineers have responsibility for conducting the practicability analysis. These agencies are still in the process of developing guidelines for practicability analysis for potential 404 permittees. For this analysis, an inventory by county regarding attitudes of local officials and land owners, social factors, and statutes and county ordinances will be conducted. This information will be made available to the responsible agencies for their consideration.

9.9 Implementation Plan for 2010

The set of water supply options that are common to the scenarios developed in the EEWMA screening analysis will be identified to develop a "short term" scenario that would include relatively low cost and non-controversial water supply measures. Input from the local interests inventory described above would be used to develop this scenario.

9.10 Retail Water Pricing and Cost Recovery Mechanisms

The initial screening analysis assumed that costs for new water supplies would be recovered through water sales. This approach may not be consistent with the way water providers actually recover costs. Alternative methods for cost recovery, including development fees, monthly service charges, real property taxes, or subsidies, will be investigated. The relative merits and impacts of alternative pricing methods (average or marginal cost pricing) will also be described.

Chapter 10

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Appendix A

Demand-Supply Graphs and Tables

APPENDIX A

Demand-Supply Graphs and Tables

This appendix summarizes the results of the screening level analysis in graph and table format. The following charts and tables provide demand and supply data by preference set and sensitivity analysis for each of the five regions.

Chart Number	Title
1	Screening Level Analysis, Unconstrained Preference Set, San Francisco Bay Region
2	Screening Level Analysis, Unconstrained Preference Set, South Coast Region
3	Screening Level Analysis, Unconstrained Preference Set, Sacramento River Region
4	Screening Level Analysis, Unconstrained Preference Set, San Joaquin River Region
5	Screening Level Analysis, Unconstrained Preference Set, Tulare Lake Region
6	Screening Level Analysis, Environmental Preference Set, San Francisco Bay Region
7	Screening Level Analysis, Environmental Preference Set, South Coast Region
8	Screening Level Analysis, Environmental Preference Set, Sacramento River Region
9	Screening Level Analysis, Environmental Preference Set, San Joaquin River Region
10	Screening Level Analysis, Environmental Preference Set, Tulare Lake Region
11	Screening Level Analysis, Urban Delta Exporters Preference Set, San Francisco Bay Region
12	Screening Level Analysis, Urban Delta Exporters Preference Set, South Coast Region
13	Screening Level Analysis, Urban Delta Exporters Preference Set, Sacramento River Region
14	Screening Level Analysis, Urban Delta Exporters Preference Set, San Joaquin River Region
15	Screening Level Analysis, Urban Delta Exporters Preference Set, Tulare Lake Region
16	Screening Level Analysis, Urban In-Delta Diverters Preference Set, San Francisco Bay Region
17	Screening Level Analysis, Urban In-Delta Diverters Preference Set, South Coast Region
18	Screening Level Analysis, Urban In-Delta Diverters Preference Set, Sacramento River Region
19	Screening Level Analysis, Urban In-Delta Diverters Preference Set, San Joaquin River Region
20	Screening Level Analysis, Urban In-Delta Diverters Preference Set, Tulare Lake Region
21	Screening Level Analysis, Delta Agriculture Preference Set, San Francisco Bay Region
22	Screening Level Analysis, Delta Agriculture Preference Set, South Coast Region
23	Screening Level Analysis, Delta Agriculture Preference Set, Sacramento River Region
24	Screening Level Analysis, Delta Agriculture Preference Set, San Joaquin River Region
25	Screening Level Analysis, Delta Agriculture Preference Set, Tulare Lake Region
26	Screening Level Analysis, Sacramento Valley Agriculture Preference Set, San Francisco Bay Region
27	Screening Level Analysis, Sacramento Valley Agriculture Preference Set, South Coast Region
28	Screening Level Analysis, Sacramento Valley Agriculture Preference Set, Sacramento River Region

Chart Number	Title
29	Screening Level Analysis, Sacramento Valley Agriculture Preference Set, San Joaquin River Region
30	Screening Level Analysis, Sacramento Valley Agriculture Preference Set, Tulare Lake Region
31	Screening Level Analysis, San Joaquin Valley Agriculture Preference Set, San Francisco Bay Region
32	Screening Level Analysis, San Joaquin Valley Agriculture Preference Set, South Coast Region
33	Screening Level Analysis, San Joaquin Valley Agriculture Preference Set, Sacramento River Region
34	Screening Level Analysis, San Joaquin Valley Agriculture Preference Set, San Joaquin River Region
35	Screening Level Analysis, San Joaquin Valley Agriculture Preference Set, Tulare Lake Region
36	Screening Level Analysis, Unconstrained Preference Set With Isolated Facility Sensitivity Analysis, San Francisco Bay Region
37	Screening Level Analysis, Unconstrained Preference Set With Isolated Facility Sensitivity Analysis, South Coast Region
38	Screening Level Analysis, Unconstrained Preference Set With Isolated Facility Sensitivity Analysis, Sacramento River Region
39	Screening Level Analysis, Unconstrained Preference Set With Isolated Facility Sensitivity Analysis, San Joaquin River Region
40	Screening Level Analysis, Unconstrained Preference Set With Isolated Facility Sensitivity Analysis, Tulare Lake Region
41	Screening Level Analysis, Low Yield Storage Sensitivity Analysis, San Francisco Bay Region
42	Screening Level Analysis, Low Yield Storage Sensitivity Analysis, South Coast Region
43	Screening Level Analysis, Low Yield Storage Sensitivity Analysis, Sacramento River Region
44	Screening Level Analysis, Low Yield Storage Sensitivity Analysis, San Joaquin River Region
45	Screening Level Analysis, Low Yield Storage Sensitivity Analysis, Tulare Lake Region
46	Screening Level Analysis, No Conjunctive Use Sensitivity Analysis, San Francisco Bay Region
47	Screening Level Analysis, No Conjunctive Use Sensitivity Analysis, South Coast Region
48	Screening Level Analysis, No Conjunctive Use Sensitivity Analysis, Sacramento River Region
49	Screening Level Analysis, No Conjunctive Use Sensitivity Analysis, San Joaquin River Region
50	Screening Level Analysis, No Conjunctive Use Sensitivity Analysis, Tulare Lake Region
51	Screening Level Analysis, Land Fallowing Cost Sensitivity Analysis, San Francisco Bay Region
52	Screening Level Analysis, Land Fallowing Cost Sensitivity Analysis, South Coast Region
53	Screening Level Analysis, Land Fallowing Cost Sensitivity Analysis, Sacramento River Region
54	Screening Level Analysis, Land Fallowing Cost Sensitivity Analysis, San Joaquin River Region
55	Screening Level Analysis, Land Fallowing Cost Sensitivity Analysis, Tulare Lake Region
56	Screening Level Analysis, Membrane Treatment Cost Sensitivity Analysis, San Francisco Bay Region
57	Screening Level Analysis, Membrane Treatment Cost Sensitivity Analysis, South Coast Region
58	Screening Level Analysis, Membrane Treatment Cost Sensitivity Analysis, Sacramento River Region
59	Screening Level Analysis, Membrane Treatment Cost Sensitivity Analysis, San Joaquin River Region
60	Screening Level Analysis, Membrane Treatment Cost Sensitivity Analysis, Tulare Lake Region
61	Screening Level Analysis, Ultraviolet Radiation Treatment Sensitivity Analysis, San Francisco Bay Region

Chart Number	Title
62	Screening Level Analysis, Ultraviolet Radiation Treatment Sensitivity Analysis, South Coast Region
63	Screening Level Analysis, Ultraviolet Radiation Treatment Sensitivity Analysis, Sacramento River Region
64	Screening Level Analysis, Ultraviolet Radiation Treatment Sensitivity Analysis, San Joaquin River Region
65	Screening Level Analysis, Ultraviolet Radiation Treatment Sensitivity Analysis, Tulare Lake Region
66	Screening Level Analysis, Urban Delta Exporters Preference Set With Isolated Facility Sensitivity Analysis, San Francisco Bay Region
67	Screening Level Analysis, Urban Delta Exporters Preference Set With Isolated Facility Sensitivity Analysis, South Coast Region
68	Screening Level Analysis, Urban Delta Exporters Preference Set With Isolated Facility Sensitivity Analysis, Sacramento River Region
69	Screening Level Analysis, Urban Delta Exporters Preference Set With Isolated Facility Sensitivity Analysis, San Joaquin River Region
70	Screening Level Analysis, Urban Delta Exporters Preference Set With Isolated Facility Sensitivity Analysis, Tulare Lake Region
71	Screening Level Analysis, Urban Demand Elasticity Sensitivity Analysis, San Francisco Bay Region
72	Screening Level Analysis, Urban Demand Elasticity Sensitivity Analysis, South Coast Region
73	Screening Level Analysis, Urban Demand Forecast Sensitivity Analysis, San Francisco Bay Region
74	Screening Level Analysis, Urban Demand Forecast Sensitivity Analysis, South Coast Region

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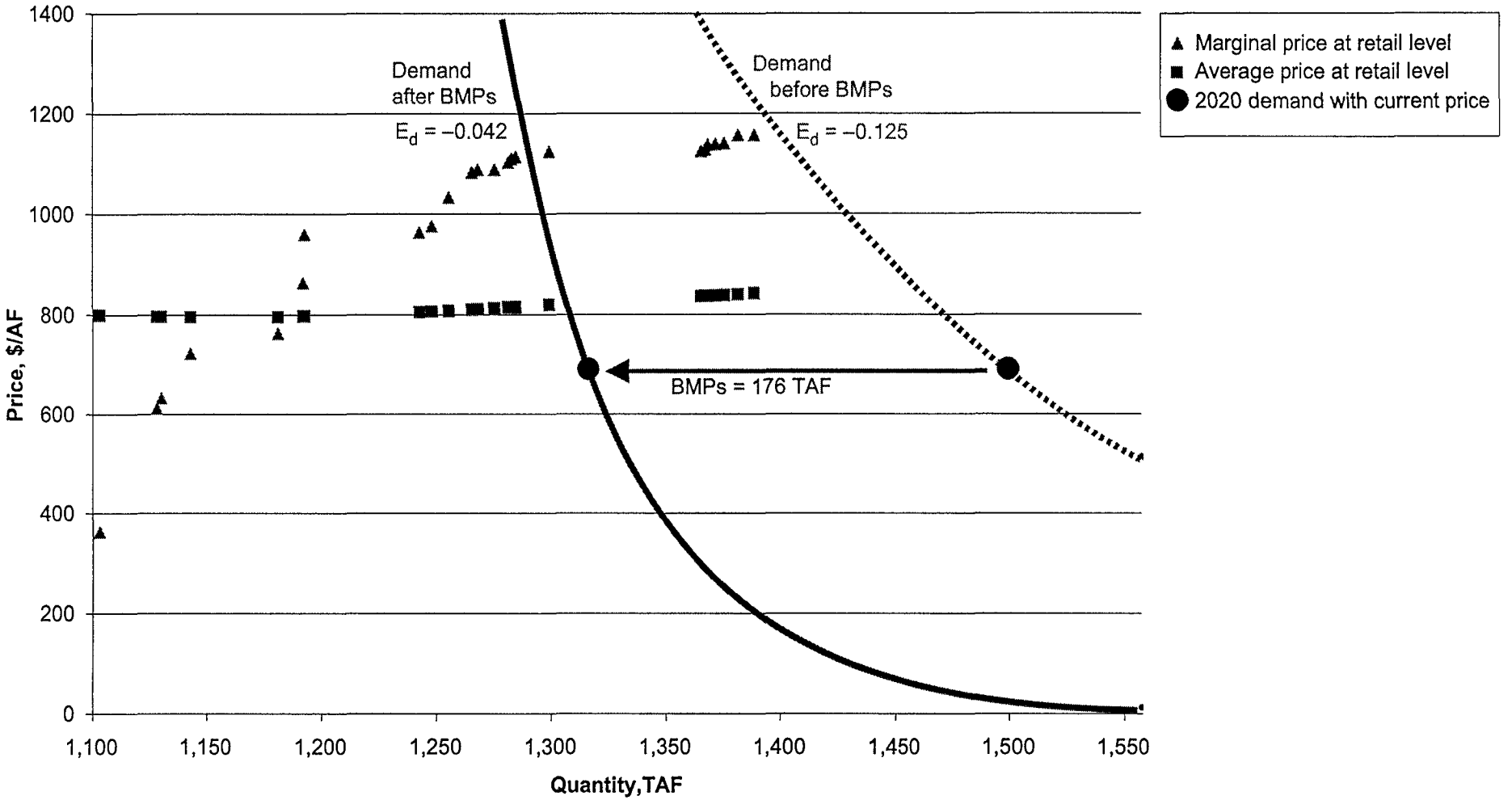

Chart 1
Screening Level Analysis
Unconstrained Preference Set
San Francisco Bay Region

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Table 1
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_N Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Pricing Using: P_D Marginal Cost at Retail	Retail Pricing Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demanc																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$279	$482	$520	25.0	1103.0	$362	$799
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$276	$482	$520	25.0	1,128.0	$612	$796
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$275	$482	$520	2.0	1,130.0	$632	$795
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$275	$482	$520	13.0	1,143.0	$722	$795
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$275	$482	$520	38.0	1,181.0	$762	$795
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$276	$482	$520	11.0	1,192.0	$862	$796
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	10%	0.094	$60	$25	$248	$0	$0	$476	$276	$482	$520	0.6	1,192.6	$958	$796
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$284	$482	$520	50.0	1,242.6	$962	$804
Other	Delta	South Delta Improvements	65	$110	1	1	10%	0.094	$90	$0	$248	$0	$0	$493	$285	$482	$520	5.5	1,248.1	$975	$805
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1	1	10%	0.164	$90	$0	$248	$0	$0	$550	$287	$482	$520	7.4	1,255.5	$1,032	$807
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$289	$482	$520	10.0	1,265.5	$1,082	$809
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	10%	0.094	$90	$25	$248	$0	$0	$606	$290	$482	$520	2.7	1,268.2	$1,088	$810
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$606	$292	$482	$520	7.1	1,275.3	$1,088	$812
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	10%	0.164	$90	$25	$248	$0	$0	$619	$293	$482	$520	5.9	1,281.2	$1,101	$813
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	10%	0.164	$90	$0	$248	$0	$0	$627	$294	$482	$520	1.3	1,282.5	$1,109	$814
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$294	$482	$520	2.0	1,284.5	$1,112	$814
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.064	$60	$25	$248	$0	$0	$641	$298	$482	$520	5.8	1,290.3	$1,123	$816
Additional options to the right of the demand function (after BMP:																					
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.1	$60	$25	$248	$0	$0	$641	$298	$482	$520	9.0	1,299.3	$1,123	$818
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.02	$90	$0	$248	$0	$0	$642	$300	$482	$520	8.1	1,307.4	$1,124	$820
Additional options to the right of the demand function if AC pricing is used (after BMP																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.144	$90	$0	$248	$0	$0	$642	$315	$482	$520	58.3	1,365.7	$1,124	$835
Land Fallow	San Joaquin	Range 1	12	$224	1	1	10%	0.164	$90	$25	$248	$0	$0	$646	$315	$482	$520	1.8	1,367.4	$1,128	$835
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$654	$316	$482	$520	1.2	1,368.6	$1,136	$836
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$656	$316	$482	$520	3.3	1,371.9	$1,138	$836
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$658	$317	$482	$520	3.8	1,375.7	$1,140	$837
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	10%	0.164	$90	$25	$248	$0	$0	$674	$319	$482	$520	5.9	1,381.6	$1,156	$839
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$674	$321	$482	$520	7.1	1,388.7	$1,156	$841
Additional options that meet screening criteria but are more expensive than those shown on the chı																					
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$331	$482	$520	39.0	1,427.7	$1,162	$851
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$682	$331	$482	$520	3.3	1,431.0	$1,164	$851
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$687	$332	$482	$520	3.8	1,434.8	$1,169	$852
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$695	$333	$482	$520	3.0	1,437.8	$1,177	$853
Land Fallow	San Joaquin	Range 2	12	$279	1	1	10%	0.164	$90	$25	$248	$0	$0	$706	$334	$482	$520	1.8	1,439.5	$1,188	$854
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$713	$334	$482	$520	3.3	1,442.8	$1,195	$854
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$718	$335	$482	$520	3.8	1,446.6	$1,200	$855
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	10%	0.164	$90	$25	$248	$0	$0	$729	$337	$482	$520	5.9	1,452.5	$1,211	$857
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$337	$482	$520	1.2	1,453.7	$1,222	$857
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$338	$482	$520	3.0	1,456.7	$1,222	$858
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$743	$340	$482	$520	7.1	1,463.8	$1,225	$860
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$746	$341	$482	$520	3.3	1,467.1	$1,228	$861
Land Fallow	Sacramento	Range 12	32	$256	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$751	$342	$482	$520	3.8	1,470.9	$1,233	$862
Land Fallow	San Joaquin	Range 3	12	$336	1	1	10%	0.164	$90	$25	$248	$0	$0	$769	$343	$482	$520	1.8	1,472.6	$1,251	$863
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$777	$344	$482	$520	3.3	1,475.9	$1,259	$864
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$783	$345	$482	$520	3.8	1,479.7	$1,265	$865
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$788	$346	$482	$520	3.0	1,482.7	$1,270	$866
Land Fallow	Tulare	Range 1	67	$387	1	1	10%	0.164	$60	$25	$248	$0	$0	$792	$349	$482	$520	9.9	1,492.6	$1,274	$869
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$812	$351	$482	$520	7.1	1,499.6	$1,294	$871
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$836	$352	$482	$520	3.0	1,502.6	$1,318	$872
Land Fallow	San Joaquin	Range 4	12	$406	1	1	10%	0.164	$90	$25	$248	$0	$0	$845	$352	$482	$520	1.8	1,504.4	$1,327	$872
Land Fallow	Tulare	Range 2	67	$438	1	1	10%	0.164	$60	$25	$248	$0	$0	$848	$355	$482	$520	9.9	1,514.3	$1,330	$875
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$377	$482	$520	70.0	1,584.3	$1,332	$897
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$403	$482	$520	85.0	1,669.3	$1,362	$923
Land Fallow	Sacramento	Range 17	10	$355	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$887	$403	$482	$520	1.2	1,670.4	$1,369	$923
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	10%	0.164	$60	$25	$248	$0	$0	$889	$403	$482	$520	0.7	1,671.2	$1,371	$923
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$896	$404	$482	$520	3.0	1,674.1	$1,378	$924

D-013518

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Table 1
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET
SAN FRANCISCO BAY REGION

Option			At Source (dry condition)									C_R		Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Pricing Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_O Delta Water Quality Cost, $/AF	Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Land Fallow	San Joaquin	Range 5	21	$452	1	1	10%	0.164	$90	$25	$248	$0	$0	$897	$405	$482	$520	3.1	1,677.2	$1,379	$925
Land Fallow	Tulare	Range 3	67	$490	1	1	10%	0.164	$60	$25	$248	$0	$0	$905	$408	$482	$520	9.9	1,687.1	$1,387	$928
Land Fallow	Tulare	Range 4	36	$492	1	1	10%	0.164	$60	$25	$248	$0	$0	$908	$410	$482	$520	5.3	1,692.4	$1,390	$930
Land Fallow	San Joaquin	Range 6	12	$483	1	1	10%	0.164	$90	$25	$248	$0	$0	$930	$410	$482	$520	1.8	1,694.2	$1,412	$930
Land Fallow	Tulare	Range 5	36	$540	1	1	10%	0.164	$60	$25	$248	$0	$0	$961	$412	$482	$520	5.3	1,699.5	$1,443	$932
Land Fallow	Tulare	Range 6	67	$542	1	1	10%	0.164	$60	$25	$248	$0	$0	$962	$415	$482	$520	9.9	1,709.4	$1,444	$935
Land Fallow	San Joaquin	Range 7	21	$522	1	1	10%	0.164	$90	$25	$248	$0	$0	$973	$416	$482	$520	3.1	1,712.5	$1,455	$936
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$419	$482	$520	7.0	1,719.5	$1,487	$939
Land Fallow	Tulare	Range 7	36	$588	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,013	$420	$482	$520	5.3	1,724.8	$1,495	$940
Land Fallow	Tulare	Range 8	67	$594	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,019	$424	$482	$520	9.9	1,734.7	$1,501	$944
Land Fallow	Tulare	Range 9	19	$607	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,034	$425	$482	$520	2.8	1,737.5	$1,516	$945
Land Fallow	San Joaquin	Range 8	21	$590	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,048	$426	$482	$520	3.1	1,740.6	$1,530	$946
Land Fallow	Tulare	Range 10	36	$635	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,065	$428	$482	$520	5.3	1,745.9	$1,547	$948
Land Fallow	Tulare	Range 11	19	$648	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,079	$429	$482	$520	2.8	1,748.7	$1,561	$949
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,100	$429	$482	$520	1.2	1,749.9	$1,582	$949
Land Fallow	Tulare	Range 12	36	$683	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,118	$431	$482	$520	5.3	1,755.2	$1,600	$951
Land Fallow	Tulare	Range 13	19	$688	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,123	$433	$482	$520	2.8	1,758.0	$1,605	$953
Land Fallow	San Joaquin	Range 9	21	$659	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,124	$434	$482	$520	3.1	1,761.1	$1,606	$954
Land Fallow	San Joaquin	Range 10	13	$694	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,162	$435	$482	$520	1.9	1,763.1	$1,644	$955
Land Fallow	Tulare	Range 14	19	$730	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,169	$436	$482	$520	2.8	1,765.9	$1,651	$956
Land Fallow	San Joaquin	Range 11	21	$728	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,201	$437	$482	$520	3.1	1,769.0	$1,683	$957
Land Fallow	San Joaquin	Range 12	13	$734	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,206	$438	$482	$520	1.9	1,770.9	$1,688	$958
Land Fallow	Tulare	Range 15	19	$771	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,214	$439	$482	$520	2.8	1,773.7	$1,696	$959
Land Fallow	San Joaquin	Range 13	13	$775	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,252	$440	$482	$520	1.9	1,775.6	$1,734	$960
Land Fallow	San Joaquin	Range 14	13	$815	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,296	$441	$482	$520	1.9	1,777.5	$1,778	$961
Land Fallow	Sacramento	Range 20	10	$866	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,315	$442	$482	$520	1.2	1,778.7	$1,797	$962
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1	1	10%	0.164	$90	$0	$248	$0	$0	$1,335	$464	$482	$520	45.8	1,824.5	$1,817	$984
Land Fallow	San Joaquin	Range 15	13	$856	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,341	$465	$482	$520	1.9	1,826.4	$1,823	$985
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,411	$465	$482	$520	0.7	1,827.1	$1,893	$985
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develop.	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$494	$482	$520	50.0	1,877.1	$2,012	$1,014
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$514	$482	$520	28.0	1,905.1	$2,362	$1,034
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	10%	0.164	$60	$25	$248	$0	$0	$2,016	$519	$482	$520	6.5	1,911.6	$2,498	$1,039
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	10%	0.164	$90	$25	$248	$0	$0	$2,049	$520	$482	$520	1.0	1,912.6	$2,531	$1,040
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	10%	0.16	$90	$25	$248	$0	$0	$2,462	$522	$482	$520	1.8	1,914.4	$2,944	$1,042

D-013519

D—013519

D-013520

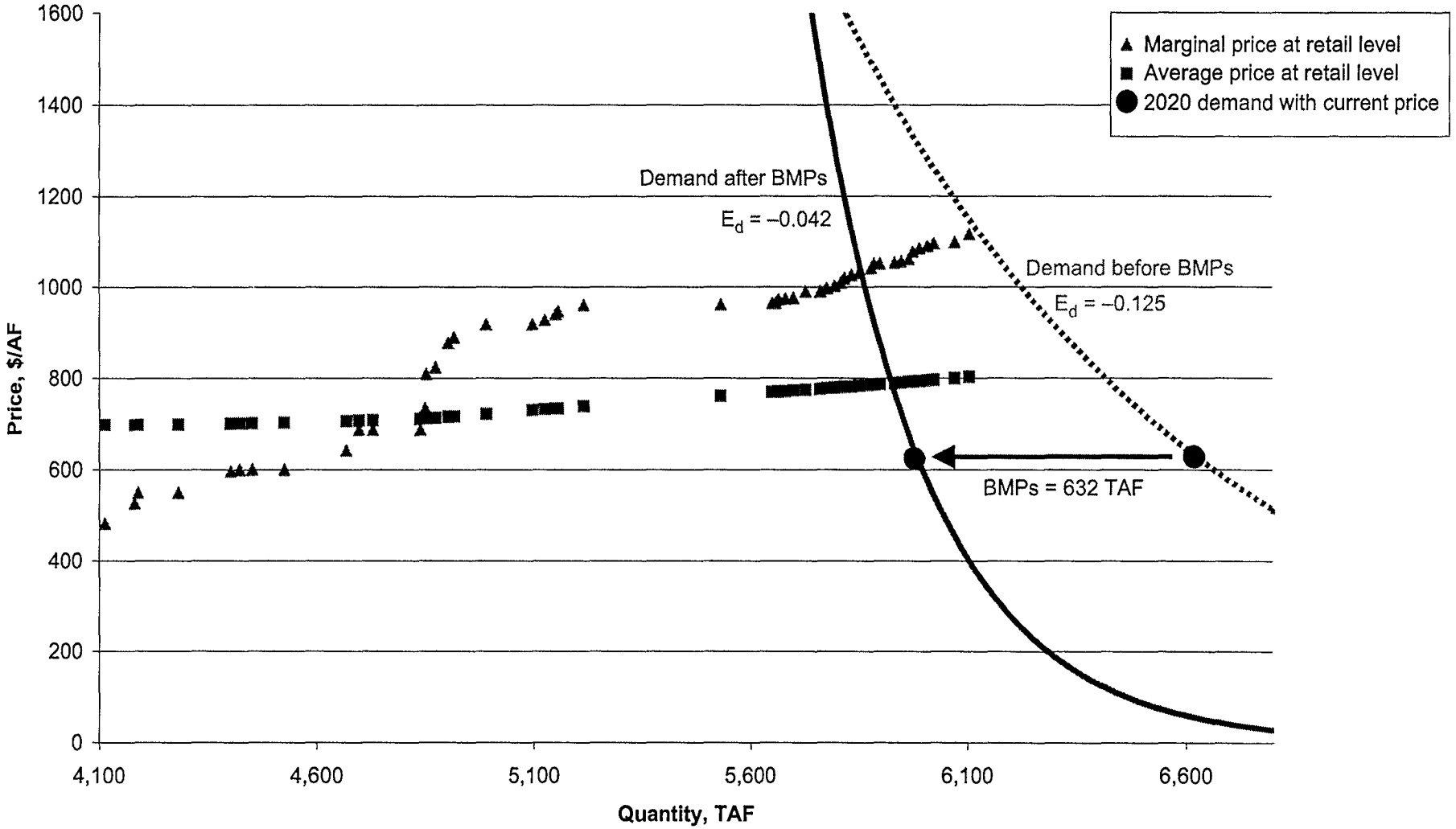

Chart 2
Screening Level Analysis
Unconstrained Preference Set
South Coast Region

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D-013521

Table 2

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS UNCONSTRAINED PREFERENCE SET

SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_o Quantity (TAF/year)	At Source (dry condition) C_o Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Lose Factor	F_A Share of New Supply Factor	C_o Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination, Retail Price Using: P_D Marginal Cost at Retail	At Destination, Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$202	$325	$500	24.0	4111.0	$486	$702
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$202	$325	$500	70.9	4,181.8	$531	$702
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$202	$325	$500	7.6	4,189.5	$554	$702
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$202	$325	$500	91.6	4,281.0	$554	$702
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$204	$325	$500	119.9	4,400.9	$600	$704
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$205	$325	$500	20.7	4,421.6	$605	$705
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$205	$325	$500	28.3	4,450.0	$605	$705
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$207	$325	$500	74.1	4,524.1	$605	$707
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$210	$325	$500	141.7	4,665.8	$646	$710
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$211	$325	$500	29.4	4,695.2	$692	$711
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$212	$325	$500	32.7	4,727.9	$692	$712
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$216	$325	$500	109.0	4,836.9	$692	$716
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$216	$325	$500	10.9	4,847.8	$738	$716
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$248	$0	$0	$487	$216	$325	$500	2.4	4,850.2	$812	$716
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.344	$140	$0	$248	$0	$0	$503	$217	$325	$500	21.9	4,872.1	$828	$717
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$555	$219	$325	$500	29.5	4,901.6	$880	$719
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.344	$140	$25	$248	$0	$0	$568	$220	$325	$500	13.5	4,915.1	$893	$720
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$226	$325	$500	73.0	4,988.1	$921	$726
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$234	$325	$500	109.0	5,097.1	$921	$734
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	10%	0.601	$140	$25	$248	$0	$0	$606	$236	$325	$500	28.3	5,125.4	$931	$736
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	10%	0.601	$140	$25	$248	$0	$0	$619	$238	$325	$500	23.6	5,149.0	$944	$738
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$626	$238	$325	$500	5.3	5,154.3	$951	$738
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	10%	0.601	$110	$25	$248	$0	$0	$639	$243	$325	$500	59.0	5,213.3	$964	$743
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$640	$265	$325	$500	317.0	5,530.2	$965	$765
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$273	$325	$500	119.9	5,650.1	$967	$773
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$643	$274	$325	$500	8.5	5,658.6	$968	$774
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$651	$274	$325	$500	5.6	5,664.2	$976	$774
Land Fallow	Sacramento	Range 2	26	$187	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$652	$275	$325	$500	15.8	5,680.0	$977	$775
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$654	$277	$325	$500	18.0	5,698.0	$979	$777
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$669	$278	$325	$500	28.2	5,726.2	$994	$778
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$669	$281	$325	$500	33.8	5,760.0	$994	$781
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$676	$282	$325	$500	15.8	5,775.8	$1,001	$782
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$681	$283	$325	$500	18.0	5,793.8	$1,006	$783
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$688	$284	$325	$500	14.2	5,808.0	$1,013	$784
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$698	$285	$325	$500	8.5	5,816.5	$1,023	$785
Land Fallow	Sacramento	Range 7	28	$228	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$705	$286	$325	$500	15.8	5,832.2	$1,030	$786
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$710	$287	$325	$500	18.0	5,850.3	$1,035	$787
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$720	$289	$325	$500	28.2	5,878.4	$1,045	$789
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$290	$325	$500	5.7	5,884.1	$1,055	$790
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$291	$325	$500	14.2	5,898.3	$1,055	$791
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.45	$140	$25	$248	$0	$0	$732	$292	$325	$500	21.2	5,919.5	$1,057	$792
Additional options to the right of the demand function (after BMPs)																					
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.268	$140	$25	$248	$0	$0	$732	$292	$325	$500	12.6	5,910.9	$1,057	$792
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$735	$293	$325	$500	15.8	5,926.7	$1,060	$793
Land Fallow	Sacramento	Range 12	32	$256	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$740	$294	$325	$500	18.0	5,944.7	$1,065	$794
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$756	$295	$325	$500	8.5	5,953.2	$1,081	$795
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$763	$296	$325	$500	15.8	5,969.0	$1,088	$796
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$768	$297	$325	$500	18.0	5,987.0	$1,093	$797
Land Fallow	Sacramento	Range 15	25	$283	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$774	$299	$325	$500	14.1	6,001.1	$1,099	$799
Land Fallow	Tulare	Range 1	67	$387	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$777	$302	$325	$500	47.2	6,048.3	$1,102	$802
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$795	$305	$325	$500	33.8	6,082.1	$1,120	$805
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 16	25	$317	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$817	$306	$325	$500	14.2	6,096.3	$1,142	$806
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$335	$325	$500	359.7	6,456.0	$1,151	$835
Land Fallow	San Joaquin	Range 4	12	$406	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$826	$336	$325	$500	8.5	6,464.4	$1,151	$836
Land Fallow	Tulare	Range 2	67	$438	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$828	$339	$325	$500	47.2	6,511.6	$1,153	$839
Land Fallow	Sacramento	Range 17	10	$355	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$864	$340	$325	$500	5.6	6,517.3	$1,189	$840
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$866	$340	$325	$500	3.5	6,520.8	$1,191	$840
Land Fallow	Sacramento	Range 18	25	$362	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$873	$341	$325	$500	14.1	6,534.9	$1,198	$841
Land Fallow	San Joaquin	Range 5	21	$452	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$873	$342	$325	$500	14.8	6,549.7	$1,198	$842
Land Fallow	Tulare	Range 3	67	$490	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$881	$346	$325	$500	47.2	6,596.9	$1,206	$846

D-013521

Table 2
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS UNCONSTRAINED PREFERENCE SET
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_S Quantity (TAF/year)	At Source (dry condition) C_S Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Land Fallow	Tulare	Range 4	36	$492	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$883	$348	$325	$500	25.4	6,622.2	$1,208	$848
Land Fallow	San Joaquin	Range 6	12	$483	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$904	$349	$325	$500	8.5	6,630.7	$1,229	$849
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$358	$325	$500	109.0	6,739.7	$1,242	$858
Land Fallow	Tulare	Range 5	36	$540	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$932	$360	$325	$500	25.4	6,765.0	$1,257	$860
Land Fallow	Tulare	Range 6	67	$542	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$933	$364	$325	$500	47.2	6,812.2	$1,258	$864
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$366	$325	$500	20.7	6,832.9	$1,265	$866
Land Fallow	San Joaquin	Range 7	21	$522	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$943	$367	$325	$500	14.6	6,847.7	$1,268	$867
Land Fallow	Tulare	Range 7	36	$588	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$980	$370	$325	$500	25.4	6,873.1	$1,305	$870
Land Fallow	Tulare	Range 8	67	$594	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$986	$374	$325	$500	47.2	6,920.3	$1,311	$874
Land Fallow	Tulare	Range 9	19	$607	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$999	$375	$325	$500	13.4	6,933.6	$1,324	$875
Land Fallow	San Joaquin	Range 8	21	$590	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,012	$376	$325	$500	14.8	6,948.4	$1,337	$876
Land Fallow	Tulare	Range 10	36	$635	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,027	$379	$325	$500	25.4	6,973.8	$1,352	$879
Land Fallow	Tulare	Range 11	19	$648	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,041	$380	$325	$500	13.4	6,987.2	$1,366	$880
Land Fallow	Sacramento	Range 19	10	$510	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,060	$381	$325	$500	5.6	6,992.8	$1,385	$881
Land Fallow	Tulare	Range 12	36	$683	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,076	$383	$325	$500	25.4	7,018.2	$1,401	$883
Land Fallow	Tulare	Range 13	19	$688	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,081	$384	$325	$500	13.4	7,031.6	$1,406	$884
Land Fallow	San Joaquin	Range 9	21	$659	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,082	$386	$325	$500	14.8	7,046.3	$1,407	$886
Land Fallow	San Joaquin	Range 10	13	$694	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,117	$387	$325	$500	9.2	7,055.5	$1,442	$887
Land Fallow	Tulare	Range 14	19	$730	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,123	$388	$325	$500	13.4	7,068.9	$1,448	$888
Land Fallow	San Joaquin	Range 11	21	$728	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,152	$390	$325	$500	14.8	7,083.7	$1,477	$890
Land Fallow	San Joaquin	Range 12	13	$734	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,157	$391	$325	$500	9.2	7,092.8	$1,482	$891
Land Fallow	Tulare	Range 15	19	$771	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,165	$392	$325	$500	13.4	7,106.2	$1,490	$892
Land Fallow	San Joaquin	Range 13	13	$775	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,199	$393	$325	$500	9.2	7,115.4	$1,524	$893
Land Fallow	San Joaquin	Range 14	13	$815	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,239	$394	$325	$500	9.2	7,124.5	$1,564	$894
Land Fallow	Sacramento	Range 20	10	$666	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,257	$395	$325	$500	5.6	7,130.2	$1,582	$895
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$878	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$1,276	$421	$325	$500	218.4	7,348.5	$1,601	$921
Land Fallow	San Joaquin	Range 15	13	$858	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,281	$422	$325	$500	9.2	7,357.7	$1,606	$922
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$425	$325	$500	20.7	7,378.4	$1,609	$925
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$437	$325	$500	109.0	7,487.4	$1,609	$937
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$488	$325	$500	474.2	7,961.5	$1,609	$988
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,345	$488	$325	$500	3.5	7,965.1	$1,670	$988
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,650	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$510	$325	$500	195.1	8,160.2	$1,747	$1,010
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$524	$325	$500	88.3	8,248.5	$2,068	$1,024
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,900	$529	$325	$500	31.0	8,279.4	$2,225	$1,029
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,931	$530	$325	$500	4.9	8,284.4	$2,256	$1,030
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$2,309	$531	$325	$500	8.5	8,292.8	$2,634	$1,031

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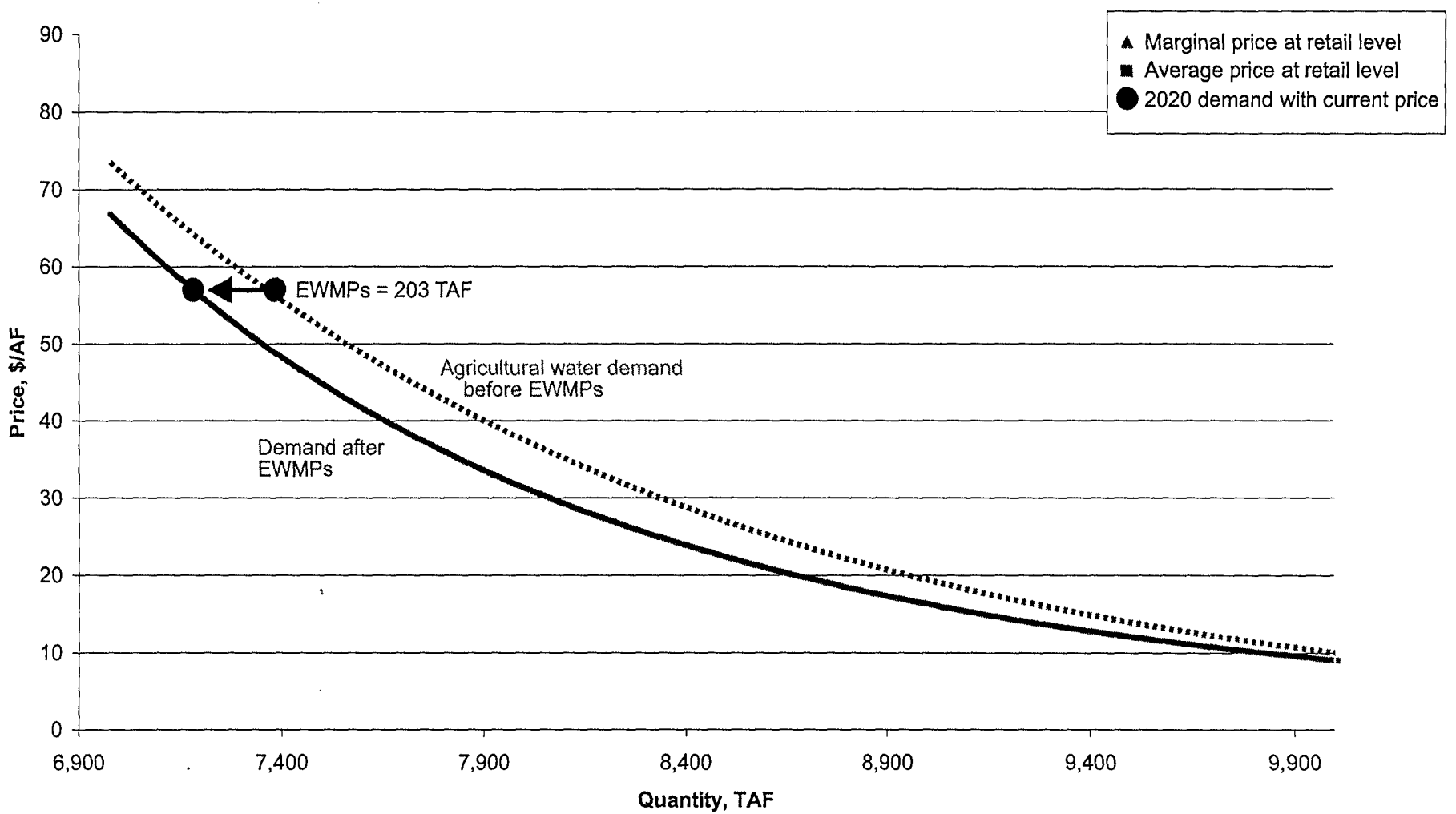

Chart 3
Screening Level Analysis
Unconstrained Preference Set
Sacramento River Region

Table 3

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET
SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

Options screened to meet demand

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D—013524

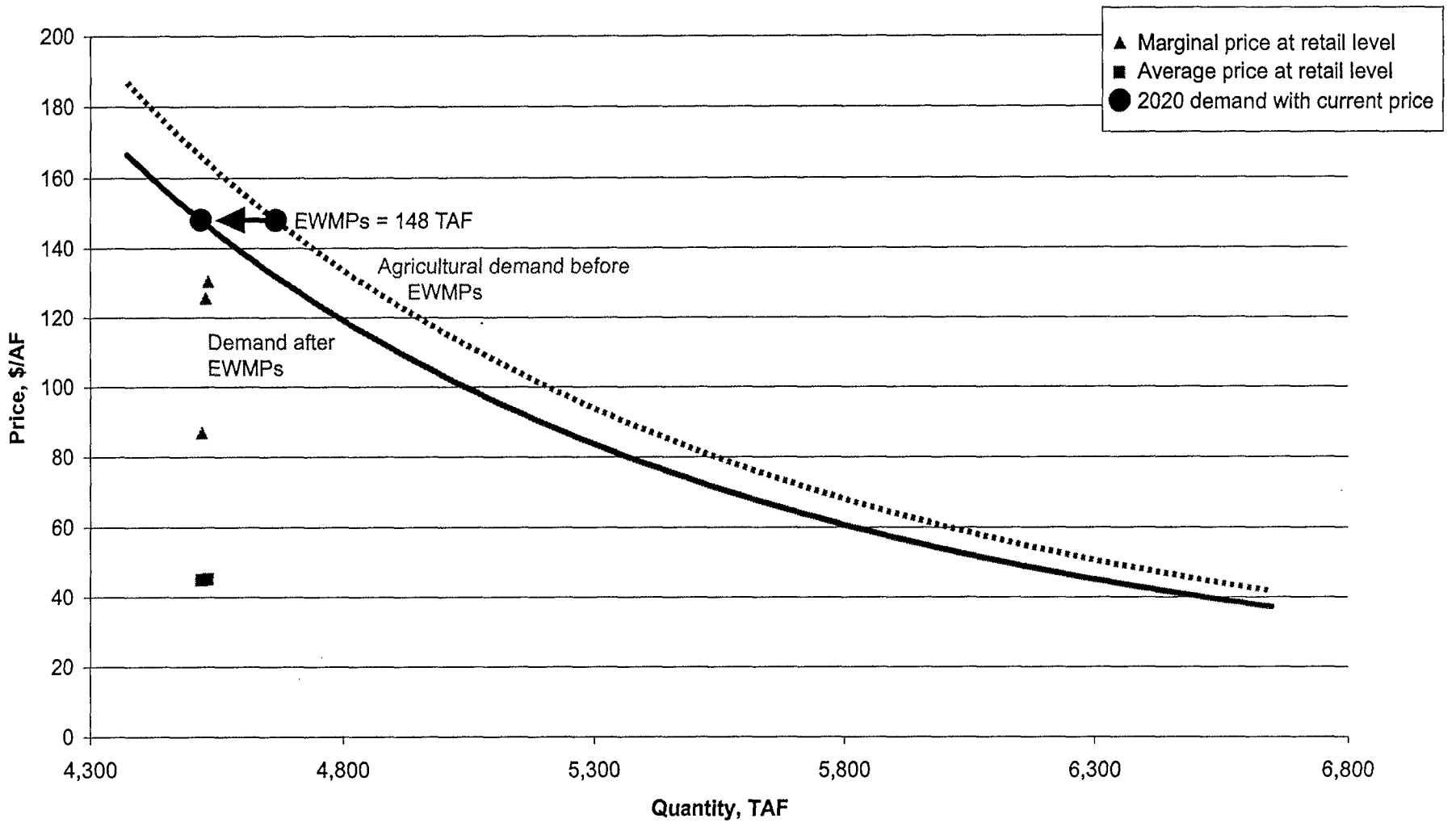

Chart 4
Screening Level Analysis
Unconstrained Preference Set
San Joaquin River Region

D-013526

Table 4

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	South Delta Improvements	65	$110	1.15	1	0.106	$30	$0	7.9	$126	4,527	$126	$45.15
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.106	$0	$0	4.9	$130	4,532	$130	$45.24

D—013526

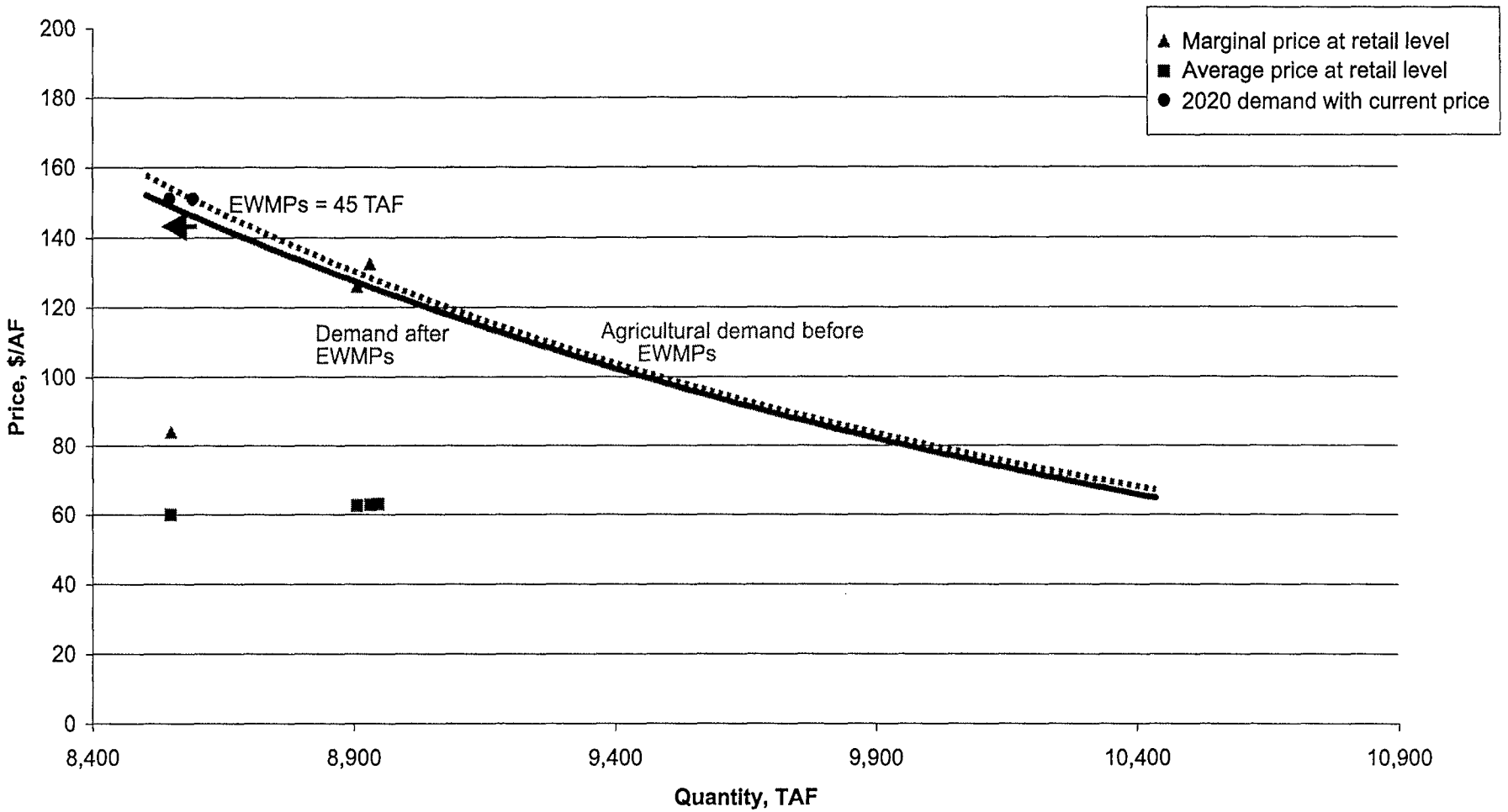

Chart 5
Screening Level Analysis
Unconstrained Preference Set
Tulare Lake Region

D-013527

D—013527

Table 5

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET
TULARE LAKE REGION

Option			At Source (dry condition)							At Destination			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,907	$126	$62.65
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,932	$132	$62.85
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0.322	$60	$25	15.3	$211	8,947	$211	$63.10

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D-013528

D-013529

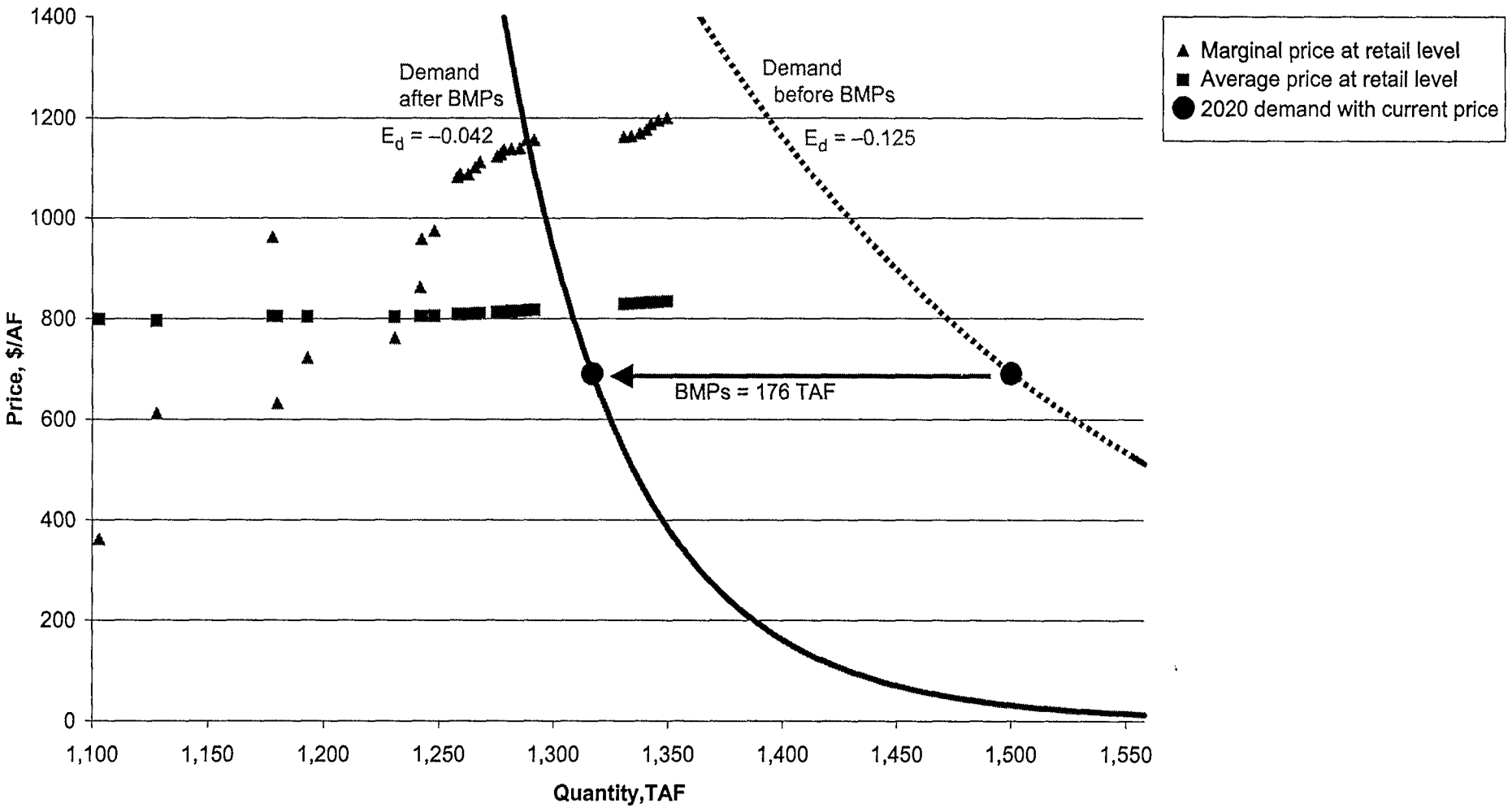

Chart 6
Screening Level Analysis
Environmental Preference Set
San Francisco Bay Region

D—013529

Table 6
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ENVIRONMENTAL PREFERENCE SET
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_0 Quantity (TAF/year)	At Source (dry condition) C_0 Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination, Retail Price Using: P_D Marginal Cost at Retail	At Destination, Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$279	$482	$520	25.0	1103.0	$362	$799
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$276	$482	$520	25.0	1,128.0	$612	$796
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$284	$482	$520	50.0	1,178.0	$962	$804
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$284	$482	$520	2.0	1,180.0	$632	$804
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$284	$482	$520	13.0	1,193.0	$722	$804
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$284	$482	$520	38.0	1,231.0	$782	$804
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$284	$482	$520	11.0	1,242.0	$862	$804
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	10%	0.094	$60	$25	$248	$0	$0	$476	$284	$482	$520	0.6	1,242.6	$958	$804
Other	Delta	South Delta improvements	65	$110	1	1	10%	0.094	$90	$0	$248	$0	$0	$493	$285	$482	$520	5.5	1,248.1	$975	$805
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$288	$482	$520	10.0	1,258.1	$1,062	$808
Active Conj. Use	San Joaquin	Project 1	20	$150	1	0.8	10%	0.094	$90	$25	$248	$0	$0	$606	$288	$482	$520	1.4	1,259.4	$1,068	$808
Active Conj. Use	Sacramento	Project 1	30	$150	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$606	$289	$482	$520	3.5	1,263.0	$1,088	$809
Active Conj. Use	San Joaquin	Project 2	20	$200	1	1	10%	0.164	$90	$25	$248	$0	$0	$619	$290	$482	$520	3.0	1,266.9	$1,101	$810
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$290	$482	$520	2.0	1,267.9	$1,112	$810
Active Conj. Use	Tulare	Project 1	50	$250	1	1	10%	0.164	$60	$25	$248	$0	$0	$641	$292	$482	$520	7.4	1,275.3	$1,123	$812
Land Fallow	San Joaquin	Range 1	12	$224	1	1	10%	0.164	$90	$25	$248	$0	$0	$648	$293	$482	$520	1.8	1277.1	$1,128	$813
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$654	$293	$482	$520	1.2	1,278.3	$1,136	$813
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$656	$294	$482	$520	3.3	1,281.6	$1,138	$814
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$658	$295	$482	$520	3.8	1,285.4	$1,140	$815
Active Conj. Use	San Joaquin	Project 3	20	$250	1	1	10%	0.164	$90	$25	$248	$0	$0	$674	$296	$482	$520	3.0	1,288.3	$1,156	$816
Active Conj. Use	Sacramento	Project 2	30	$200	1	0.8	10%	0.02	$90	$25	$248	$0	$0	$674	$296	$482	$520	0.4	1,288.7	$1,156	$816
Additional options to the right of the demand function (after BMPs)																					
Active Conj. Use	Sacramento	Project 2	30	$200	1	0.8	10%	0.144	$90	$25	$248	$0	$0	$674	$297	$482	$520	3.1	1,291.9	$1,156	$817
Urban WUE	S.F. Bay	*Reduce indoor water use from 60 to 55 gpcd*	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$308	$482	$520	39.0	1,330.9	$1,162	$828
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$682	$309	$482	$520	3.3	1,334.2	$1,164	$829
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$687	$310	$482	$520	3.8	1,337.9	$1,169	$830
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$695	$311	$482	$520	3.0	1,340.9	$1,177	$831
Land Fallow	San Joaquin	Range 2	12	$279	1	1	10%	0.164	$90	$25	$248	$0	$0	$706	$312	$482	$520	1.8	1,342.7	$1,188	$832
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$713	$313	$482	$520	3.3	1,346.0	$1,195	$833
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$718	$314	$482	$520	3.8	1,349.8	$1,200	$834
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Active Conj. Use	San Joaquin	Project 4	20	$300	1	1	10%	0.164	$90	$25	$248	$0	$0	$729	$315	$482	$520	3.0	1,352.7	$1,211	$835
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$315	$482	$520	1.2	1,353.9	$1,222	$835
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$316	$482	$520	3.0	1,356.9	$1,222	$836
Active Conj. Use	Sacramento	Project 3	30	$250	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$743	$317	$482	$520	3.5	1,360.4	$1,225	$837
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$746	$318	$482	$520	3.3	1,363.7	$1,228	$838
Land Fallow	Sacramento	Range 12	32	$258	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$751	$319	$482	$520	3.8	1,367.5	$1,233	$839
Land Fallow	San Joaquin	Range 3	12	$336	1	1	10%	0.164	$90	$25	$248	$0	$0	$769	$320	$482	$520	1.8	1,369.3	$1,251	$840
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$777	$321	$482	$520	3.3	1,372.6	$1,259	$841
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$783	$322	$482	$520	3.8	1,376.4	$1,265	$842
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$788	$323	$482	$520	3.0	1,379.3	$1,270	$843
Land Fallow	Tulare	Range 1	67	$387	1	1	10%	0.164	$60	$25	$248	$0	$0	$792	$327	$482	$520	9.9	1,389.2	$1,274	$847
Active Conj. Use	Sacramento	Project 4	30	$300	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$812	$328	$482	$520	3.5	1,392.7	$1,294	$848
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$836	$329	$482	$520	3.0	1,395.7	$1,318	$849
Land Fallow	San Joaquin	Range 4	12	$406	1	1	10%	0.164	$90	$25	$248	$0	$0	$845	$330	$482	$520	1.8	1,397.5	$1,327	$850
Land Fallow	Tulare	Range 2	67	$438	1	1	10%	0.164	$60	$25	$248	$0	$0	$848	$333	$482	$520	9.9	1,407.4	$1,330	$853
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$358	$482	$520	70.0	1,477.4	$1,332	$878
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$386	$482	$520	85.0	1,562.4	$1,362	$908
Land Fallow	Sacramento	Range 17	10	$355	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$887	$387	$482	$520	1.2	1,563.6	$1,369	$907
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	10%	0.164	$60	$25	$248	$0	$0	$889	$387	$482	$520	0.7	1,564.3	$1,371	$907
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$896	$388	$482	$520	3.0	1,567.3	$1,378	$908
Land Fallow	San Joaquin	Range 5	21	$452	1	1	10%	0.164	$90	$25	$248	$0	$0	$897	$389	$482	$520	3.1	1,570.4	$1,379	$909
Land Fallow	Tulare	Range 3	67	$490	1	1	10%	0.164	$60	$25	$248	$0	$0	$905	$392	$482	$520	9.9	1,580.2	$1,387	$912
Land Fallow	Tulare	Range 4	36	$492	1	1	10%	0.164	$60	$25	$248	$0	$0	$908	$394	$482	$520	5.3	1,585.6	$1,390	$914
Land Fallow	San Joaquin	Range 6	12	$463	1	1	10%	0.164	$90	$25	$248	$0	$0	$930	$394	$482	$520	1.8	1,587.3	$1,412	$914
Land Fallow	Tulare	Range 5	36	$540	1	1	10%	0.164	$60	$25	$248	$0	$0	$961	$396	$482	$520	5.3	1,592.6	$1,443	$916
Land Fallow	Tulare	Range 6	67	$542	1	1	10%	0.164	$60	$25	$248	$0	$0	$962	$400	$482	$520	9.9	1,602.5	$1,444	$920
Land Fallow	San Joaquin	Range 7	21	$522	1	1	10%	0.164	$90	$25	$248	$0	$0	$973	$401	$482	$520	3.1	1,605.6	$1,455	$921
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$403	$482	$520	7.0	1,612.6	$1,487	$923
Land Fallow	Tulare	Range 7	36	$588	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,013	$405	$482	$520	5.3	1,617.9	$1,495	$925
Land Fallow	Tulare	Range 8	67	$594	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,019	$409	$482	$520	9.9	1,627.8	$1,501	$929
Land Fallow	Tulare	Range 9	19	$607	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,034	$410	$482	$520	2.8	1,630.6	$1,516	$930
Land Fallow	San Joaquin	Range 8	21	$590	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,048	$412	$482	$520	3.1	1,633.7	$1,530	$932
Land Fallow	Tulare	Range 10	36	$635	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,065	$414	$482	$520	5.3	1,639.0	$1,547	$934

D-013530

D—013530

Table 6
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ENVIRONMENTAL PREFERENCE SET
SAN FRANCISCO BAY REGION

Option			At Source (dry condition)		F_R	F_D	F_B	F_A	C_C	C_T	C_Q	C_R	C_W	Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	Reapplication Factor	Delta Loss Factor	MT Brine Loss Factor	Share of New Supply Factor	Transport Cost	Transaction Fee, $/AF	Delta Water Quality Cost, $/AF	Water Use Efficiency & Recycling Avoided Cost, $/AF	Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Land Fallow	Tulare	Range 11	19	$848	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,079	$415	$482	$520	2.8	1,641.9	$1,561	$935
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,100	$415	$482	$520	1.2	1,643.0	$1,582	$935
Land Fallow	Tulare	Range 12	36	$683	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,118	$418	$482	$520	5.3	1,648.3	$1,600	$938
Land Fallow	Tulare	Range 13	19	$688	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,123	$419	$482	$520	2.8	1,651.2	$1,605	$939
Land Fallow	San Joaquin	Range 9	21	$659	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,124	$420	$482	$520	3.1	1,654.3	$1,606	$940
Land Fallow	San Joaquin	Range 10	13	$694	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,162	$421	$482	$520	1.9	1,656.2	$1,644	$941
Land Fallow	Tulare	Range 14	19	$730	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,169	$422	$482	$520	2.8	1,659.0	$1,651	$942
Land Fallow	San Joaquin	Range 11	21	$729	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,201	$424	$482	$520	3.1	1,662.1	$1,683	$944
Land Fallow	San Joaquin	Range 12	13	$734	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,206	$425	$482	$520	1.9	1,664.0	$1,688	$945
Land Fallow	Tulare	Range 15	19	$771	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,214	$426	$482	$520	2.8	1,666.8	$1,696	$946
Land Fallow	San Joaquin	Range 13	13	$775	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,252	$427	$482	$520	1.9	1,668.7	$1,734	$947
Land Fallow	San Joaquin	Range 14	13	$815	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,296	$428	$482	$520	1.9	1,670.6	$1,778	$948
Land Fallow	Sacramento	Range 20	10	$866	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,315	$428	$482	$520	1.2	1,671.8	$1,797	$948
Land Fallow	San Joaquin	Range 15	13	$856	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,341	$429	$482	$520	1.9	1,673.7	$1,823	$949
Ag WUE	Tulare	Increase efficiency, Range 3	5	$960	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,411	$430	$482	$520	0.7	1,674.5	$1,893	$950
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develop.	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$462	$482	$520	50.0	1,724.5	$2,012	$982
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$484	$482	$520	28.0	1,752.5	$2,362	$1,004
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	10%	0.164	$60	$25	$248	$0	$0	$2,016	$490	$482	$520	6.5	1,759.0	$2,498	$1,010
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	10%	0.164	$90	$25	$248	$0	$0	$2,049	$491	$482	$520	1.0	1,760.0	$2,531	$1,011
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	10%	0.16	$90	$25	$248	$0	$0	$2,462	$493	$482	$520	1.8	1,761.8	$2,944	$1,013

D-013531

D—013531

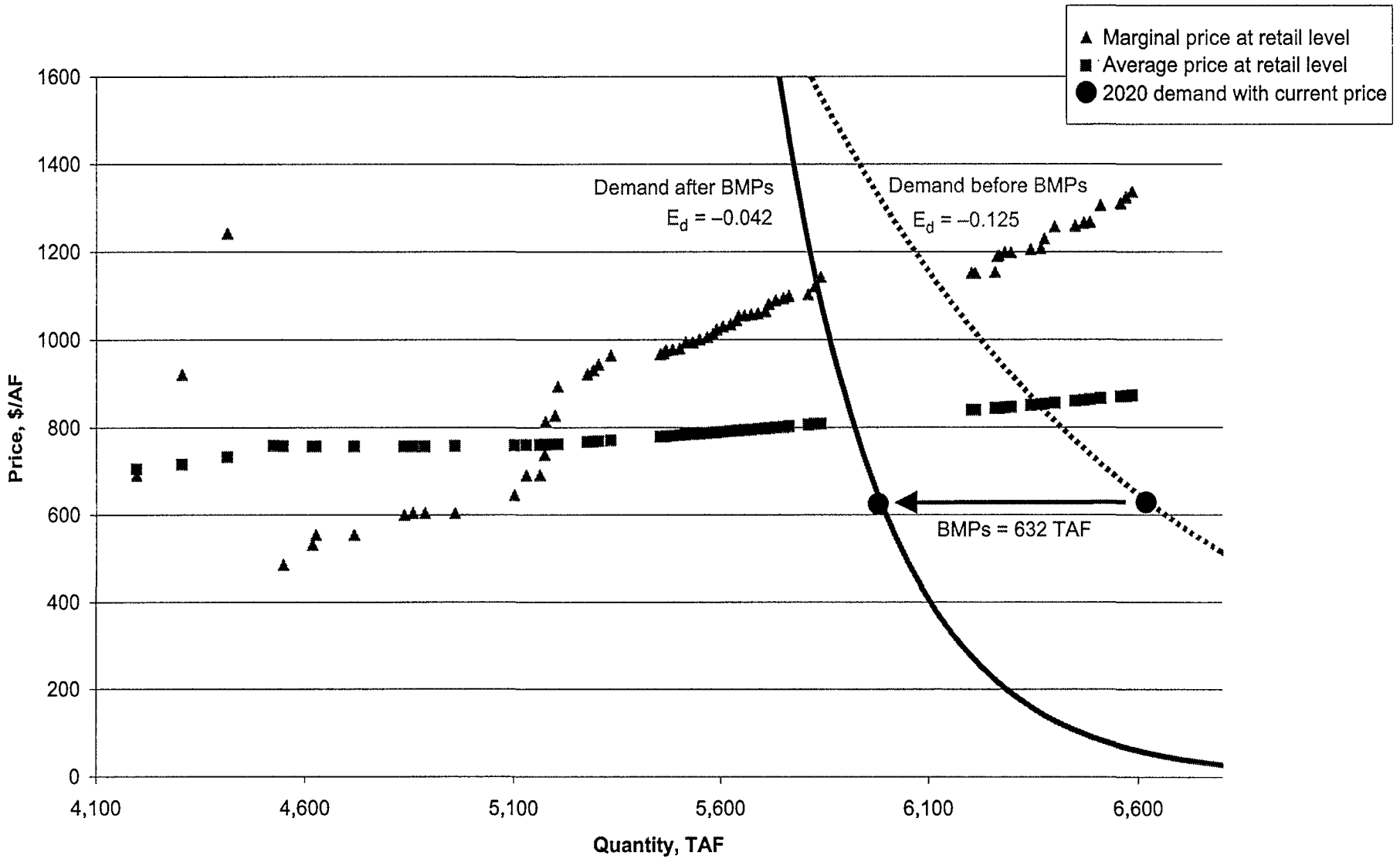

Chart 7
Screening Level Analysis
Environmental Preference Set
South Coast Region

D-013532

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Table 7

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ENVIRONMENTAL PREFERENCE SET
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_S Quantity (TAF/year)	At Source (dry condition) C_S Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_B Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			828																		
Options screened to meet demand																					
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$206	$325	$500	109.0	4,196.0	$692	$706
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$218	$325	$500	109.0	4,305.0	$921	$716
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$234	$325	$500	109.0	4,414.0	$1,242	$734
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$259	$325	$500	109.0	4,523.0	$1,609	$759
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$258	$325	$500	24.0	4,547.0	$486	$758
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$258	$325	$500	70.9	4,617.8	$631	$758
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$257	$325	$500	7.6	4,625.5	$554	$757
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$60	$0	$229	$257	$325	$500	91.6	4,717.0	$554	$757
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$257	$325	$500	119.9	4,836.9	$600	$757
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$257	$325	$500	20.7	4,857.6	$605	$757
Other	Color. River	Coachella Canal lining	28	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$258	$325	$500	28.3	4,886.0	$605	$758
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$258	$325	$500	74.1	4,960.1	$605	$758
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$260	$325	$500	141.7	5,101.8	$646	$760
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$260	$325	$500	29.4	5,131.2	$692	$760
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$261	$325	$500	32.7	5,163.9	$692	$761
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$261	$325	$500	10.9	5,174.8	$738	$761
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$248	$0	$0	$487	$261	$325	$500	2.4	5,177.2	$812	$761
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.344	$140	$0	$248	$0	$0	$503	$262	$325	$500	21.9	5,199.1	$828	$762
Active Conj. Use	San Joaquin	Project 1	20	$150	1.09	1	10%	0.344	$140	$25	$248	$0	$0	$588	$263	$325	$500	6.7	5,205.9	$893	$763
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$267	$325	$500	73.0	5,278.9	$921	$767
Active Conj. Use	Sacramento	Project 1	30	$180	1.09	0.8	10%	0.601	$140	$25	$248	$0	$0	$606	$268	$325	$500	14.1	5,293.0	$931	$768
Active Conj. Use	San Joaquin	Project 2	20	$200	1.09	1	10%	0.601	$140	$25	$248	$0	$0	$619	$269	$325	$500	11.8	5,304.8	$944	$769
Active Conj. Use	Tulare	Project 1	50	$250	1.09	1	10%	0.601	$110	$25	$248	$0	$0	$639	$271	$325	$500	29.5	5,334.3	$964	$771
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$279	$325	$500	119.9	5,454.2	$967	$779
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	10%	0.601	$140	$25	$248	$0	$0	$643	$280	$325	$500	7.1	5,461.3	$968	$780
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	10%	0.601	$140	$25	$248	$0	$0	$651	$280	$325	$500	4.7	5,466.0	$976	$780
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	10%	0.601	$140	$25	$248	$0	$0	$652	$281	$325	$500	13.2	5,479.2	$977	$781
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	10%	0.601	$140	$25	$248	$0	$0	$654	$282	$325	$500	15.1	5,494.3	$979	$782
Active Conj. Use	San Joaquin	Project 3	20	$250	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$669	$283	$325	$500	14.1	5,508.4	$994	$783
Active Conj. Use	Sacramento	Project 2	30	$200	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$669	$284	$325	$500	16.9	5,525.3	$994	$784
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$676	$285	$325	$500	15.8	5,541.1	$1,001	$785
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$681	$287	$325	$500	18.0	5,559.1	$1,006	$787
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$688	$288	$325	$500	14.2	5,573.3	$1,013	$788
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$698	$288	$325	$500	8.5	5,581.7	$1,023	$788
Land Fallow	Sacramento	Range 7	28	$228	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$705	$289	$325	$500	15.8	5,597.5	$1,030	$789
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$710	$291	$325	$500	18.0	5,615.6	$1,035	$791
Active Conj. Use	San Joaquin	Project 4	20	$300	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$720	$292	$325	$500	14.1	5,629.6	$1,045	$792
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$292	$325	$500	5.7	5,635.3	$1,055	$792
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$293	$325	$500	14.2	5,649.5	$1,055	$793
Active Conj. Use	Sacramento	Project 3	30	$250	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$732	$296	$325	$500	16.9	5,666.4	$1,057	$795
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$735	$296	$325	$500	15.8	5,682.2	$1,060	$796
Land Fallow	Sacramento	Range 12	32	$258	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$740	$297	$325	$500	18.0	5,700.2	$1,065	$797
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$758	$298	$325	$500	8.5	5,708.7	$1,081	$798
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$763	$299	$325	$500	15.8	5,724.5	$1,088	$799
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$768	$301	$325	$500	18.0	5,742.5	$1,093	$801
Land Fallow	Sacramento	Range 15	25	$283	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$774	$302	$325	$500	14.1	5,756.6	$1,099	$802
Land Fallow	Tulare	Range 1	67	$387	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$777	$306	$325	$500	47.2	5,803.8	$1,102	$806
Active Conj. Use	Sacramento	Project 4	30	$300	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$796	$307	$325	$500	16.9	5,820.7	$1,120	$807
Land Fallow	Sacramento	Range 16	25	$317	1.09	0.8	10%	0.43	$140	$25	$248	$0	$0	$817	$308	$325	$500	8.5	5,829.2	$1,142	$808
Additional options to the right of the demand function (after BMPs)																					
Land Fallow	Sacramento	Range 16	25	$317	1.09	0.8	10%	0.298	$140	$25	$248	$0	$0	$817	$308	$325	$500	5.7	5,834.9	$1,142	$808
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$338	$325	$500	359.7	6,194.6	$1,151	$838
Land Fallow	San Joaquin	Range 4	12	$406	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$826	$339	$325	$500	8.5	6,203.0	$1,151	$839
Land Fallow	Tulare	Range 2	67	$438	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$828	$343	$325	$500	47.2	6,250.2	$1,153	$843
Land Fallow	Sacramento	Range 17	10	$355	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$864	$343	$325	$500	5.6	6,255.8	$1,189	$843
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$866	$344	$325	$500	3.5	6,259.4	$1,191	$844
Land Fallow	Sacramento	Range 18	25	$362	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$873	$345	$325	$500	14.1	6,273.5	$1,198	$845
Land Fallow	San Joaquin	Range 5	21	$452	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$873	$348	$325	$500	14.8	6,288.2	$1,198	$848
Land Fallow	Tulare	Range 3	67	$490	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$881	$350	$325	$500	47.2	6,335.4	$1,206	$850
Land Fallow	Tulare	Range 4	36	$492	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$883	$352	$325	$500	25.4	6,360.8	$1,208	$852
Land Fallow	San Joaquin	Range 6	12	$483	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$904	$353	$325	$500	8.5	6,369.2	$1,229	$853
Land Fallow	Tulare	Range 5	36	$540	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$932	$355	$325	$500	25.4	6,394.6	$1,257	$855
Land Fallow	Tulare	Range 6	67	$542	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$933	$359	$325	$500	47.2	6,441.8	$1,258	$859
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$361	$325	$500	20.7	6,462.5	$1,265	$861
Land Fallow	San Joaquin	Range 7	21	$522	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$943	$363	$325	$500	14.8	6,477.3	$1,268	$863
Land Fallow	Tulare	Range 7	36	$588	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$960	$365	$325	$500	25.4	6,502.7	$1,305	$865

D-013533

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Table 7

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ENVIRONMENTAL PREFERENCE SET
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination, Retail Price Using: P_D Marginal Cost at Retail	At Destination, Retail Price Using: P_D Average Cost at Retail
Land Fallow	Tulare	Range 8	67	$594	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$966	$369	$325	$500	47.2	6,549.8	$1,311	$869
Land Fallow	Tulare	Range 9	19	$607	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$999	$371	$325	$500	13.4	6,563.2	$1,324	$871
Land Fallow	San Joaquin	Range 8	21	$590	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,012	$372	$325	$500	14.8	6,578.0	$1,337	$872
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Tulare	Range 10	36	$635	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,027	$375	$325	$500	25.4	6,603.4	$1,352	$875
Land Fallow	Tulare	Range 11	19	$648	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,041	$376	$325	$500	13.4	6,616.8	$1,366	$876
Land Fallow	Sacramento	Range 19	10	$510	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,060	$377	$325	$500	5.6	6,622.4	$1,385	$877
Land Fallow	Tulare	Range 12	36	$683	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,078	$379	$325	$500	25.4	6,647.7	$1,401	$879
Land Fallow	Tulare	Range 13	19	$688	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,081	$381	$325	$500	13.4	6,661.1	$1,406	$881
Land Fallow	San Joaquin	Range 9	21	$659	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,082	$382	$325	$500	14.8	6,675.9	$1,407	$882
Land Fallow	San Joaquin	Range 10	13	$694	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,117	$383	$325	$500	9.2	6,685.1	$1,442	$883
Land Fallow	Tulare	Range 14	19	$730	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,123	$385	$325	$500	13.4	6,698.5	$1,448	$885
Land Fallow	San Joaquin	Range 11	21	$728	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,152	$386	$325	$500	14.8	6,713.3	$1,477	$886
Land Fallow	San Joaquin	Range 12	13	$734	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,157	$387	$325	$500	9.2	6,722.4	$1,482	$887
Land Fallow	Tulare	Range 15	19	$771	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,165	$389	$325	$500	13.4	6,735.8	$1,490	$889
Land Fallow	San Joaquin	Range 13	13	$775	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,199	$390	$325	$500	9.2	6,745.0	$1,524	$890
Land Fallow	San Joaquin	Range 14	13	$815	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,239	$391	$325	$500	9.2	6,754.1	$1,564	$891
Land Fallow	Sacramento	Range 20	10	$866	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,257	$392	$325	$500	5.6	6,759.7	$1,582	$892
Land Fallow	San Joaquin	Range 15	13	$856	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,281	$393	$325	$500	9.2	6,768.9	$1,606	$893
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$396	$325	$500	20.7	6,789.6	$1,609	$896
Urban Recycling	South Coast	Range 5	436	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$454	$325	$500	474.2	7,263.8	$1,609	$954
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,345	$454	$325	$500	3.5	7,267.3	$1,670	$954
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,550	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$480	$325	$500	195.1	7,462.4	$1,747	$980
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$494	$325	$500	88.3	7,550.7	$2,068	$994
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,900	$500	$325	$500	31.0	7,581.7	$2,225	$1,000
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,931	$501	$325	$500	4.9	7,586.6	$2,256	$1,001
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$2,309	$503	$325	$500	8.5	7,595.1	$2,634	$1,003

D-013534

D—013534

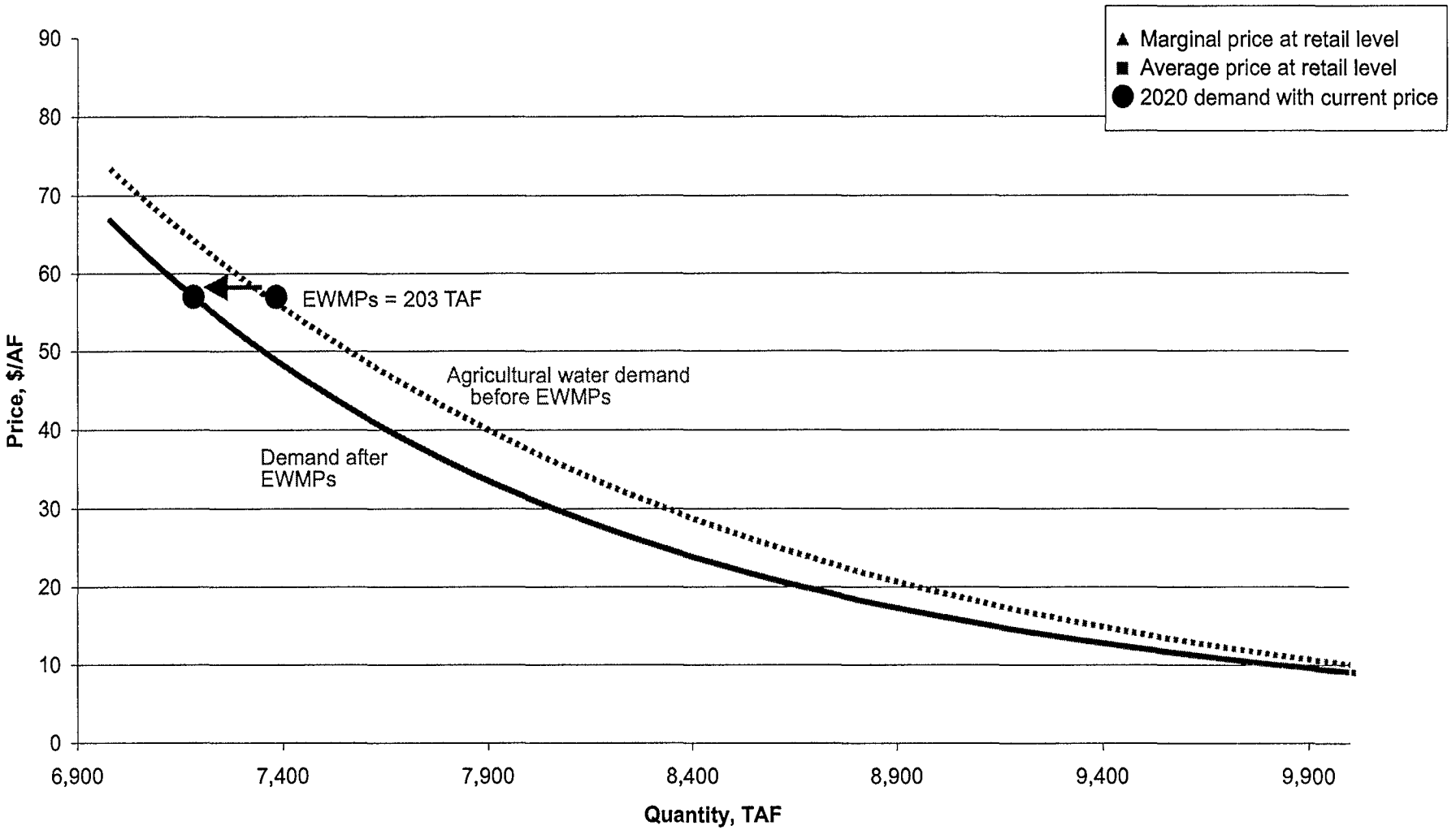

Chart 8
Screening Level Analysis
Environmental Preference Set
Sacramento River Region

D-013535

D—013535

Table 8

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ENVIRONMENTAL PREFERENCE SET
SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

Options screened to meet demand

D-013536

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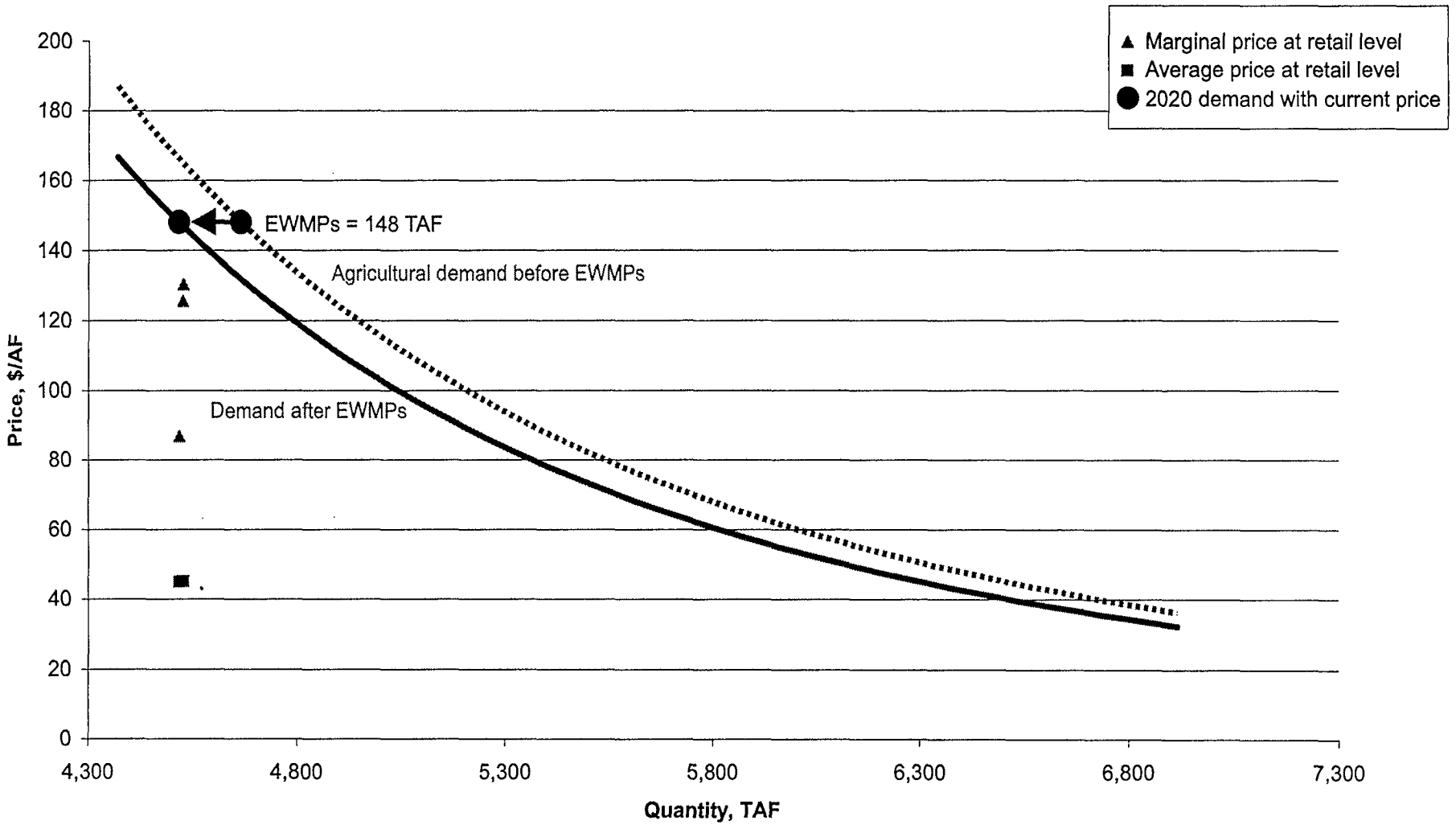

Chart 9
Screening Level Analysis
Environmental Preference Set
San Joaquin River Region

D-013538

Table 9

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ENVIRONMENTAL PREFERENCE SET
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	South Delta Improvements	65	$110	1.15	1	0.106	$30	$0	7.9	$126	4,527	$126	$45.15
Active Conj. Use	San Joaquin	Project 1	20	$150	1.15	1	0.106	$0	$0	2.4	$130	4,529	$130	$45.19

D—013538

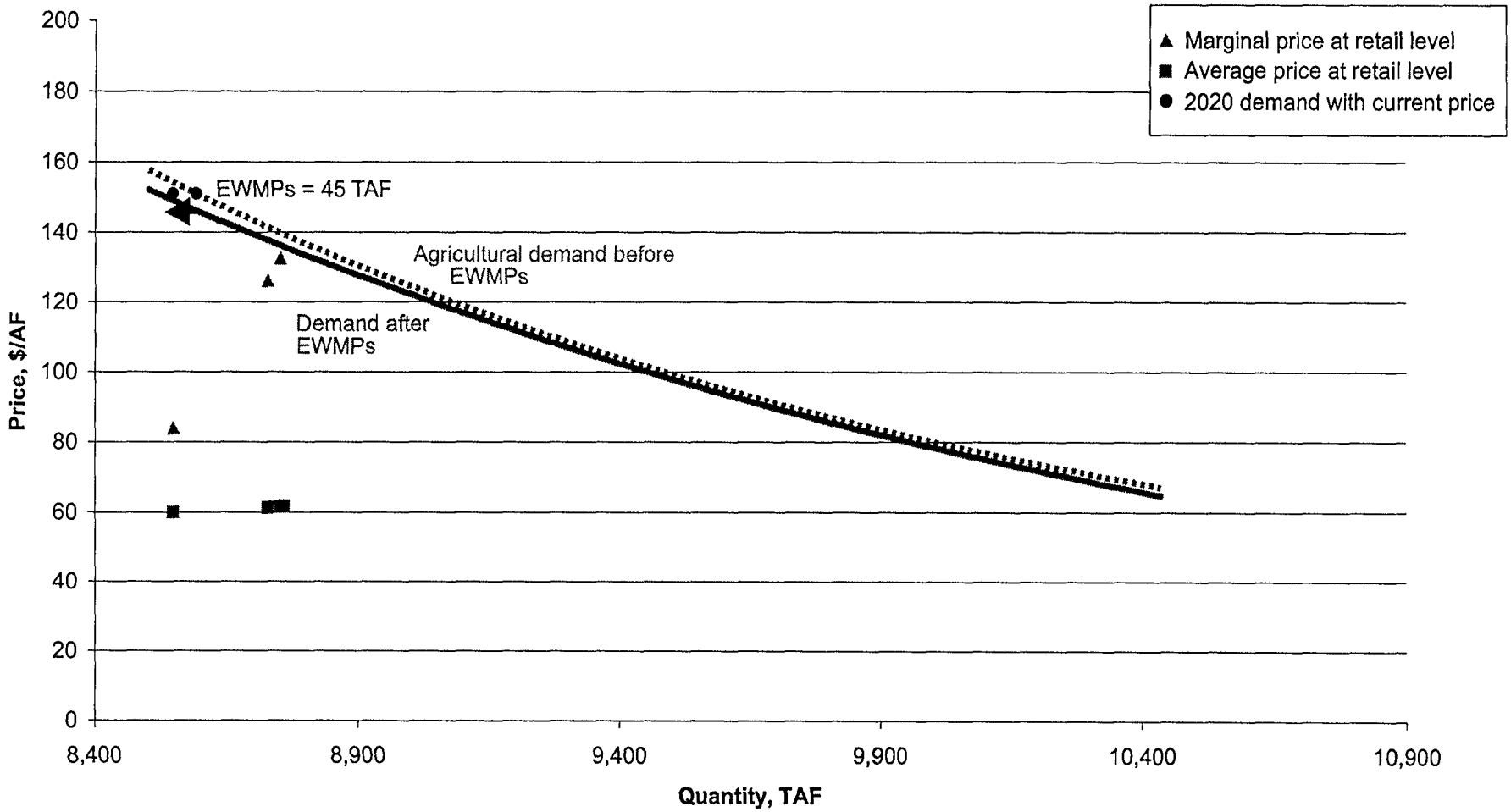

Chart 10
Screening Level Analysis
Environmental Preference Set
Tulare Lake Region

D-013540

Table 10

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ENVIRONMENTAL PREFERENCE SET
TULARE LAKE REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Active Conj. Use	Tulare	Kern Water Bank	150	$150	1.19	1	1	$0	$0	178.5	$126	8,728	$126	$61.36
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,753	$132	$61.56
Active Conj. Use	San Joaquin	Project 1	20	$150	1.19	1	0.322	$60	$25	7.7	$211	8,761	$211	$61.69

D—013540

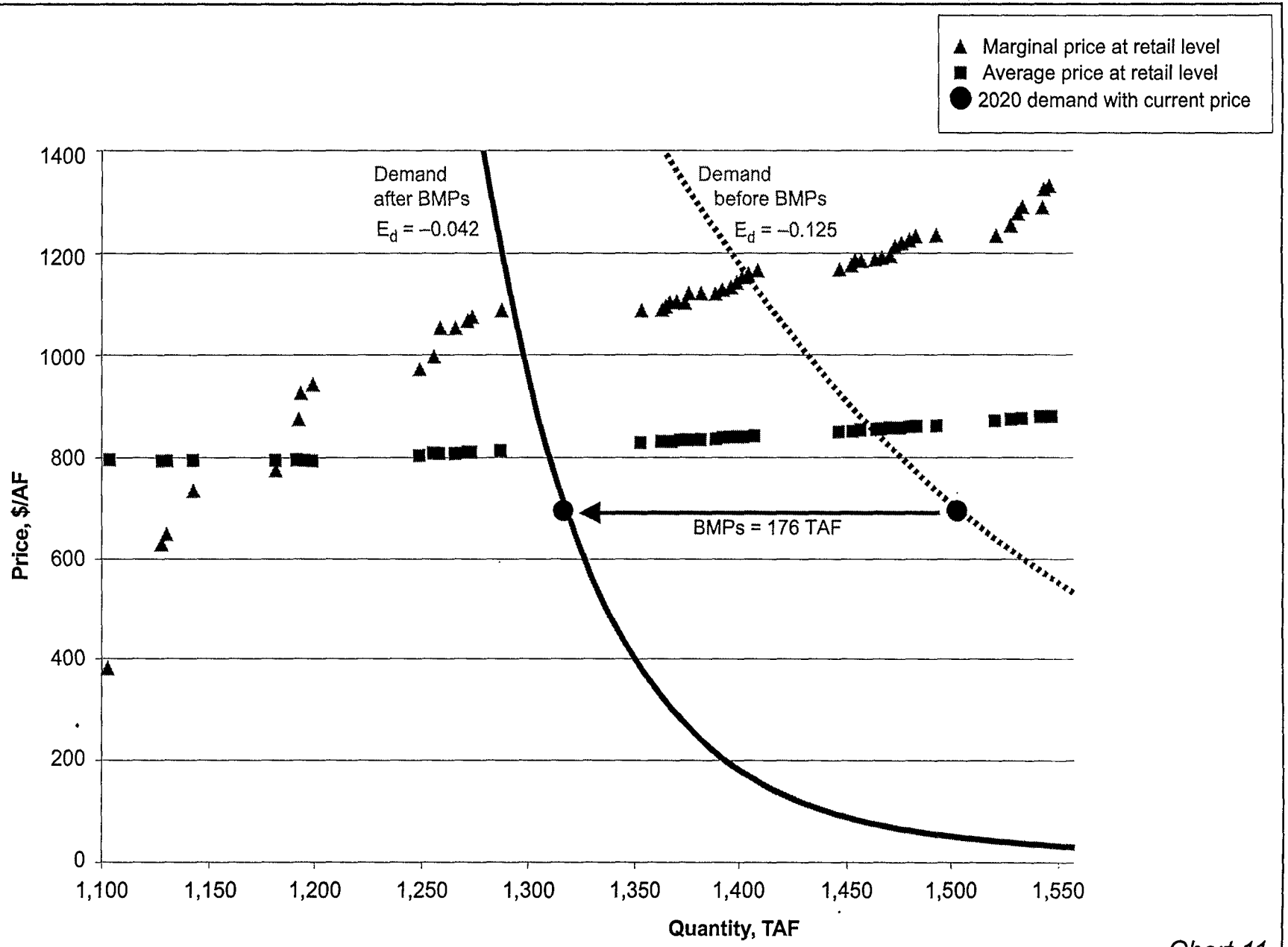

Chart 11
Screening Level Analysis
Urban Delta Exporters Preference Set
San Francisco Bay Region

D-013541

D-013541

Table 11
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DELTA EXPORTERS PREFERENCE SET
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_0 Quantity (TAF/year)	At Source (dry condition) C_0 Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination, Retail Price Using: P_D Marginal Cost at Retail	At Destination, Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$263	$482	$520	25.0	1103.0	$362	$783
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$260	$482	$520	25.0	1,128.0	$612	$780
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$260	$482	$520	2.0	1,130.0	$632	$780
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$260	$482	$520	13.0	1,143.0	$722	$780
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$260	$482	$520	38.0	1,181.0	$762	$780
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$261	$482	$520	11.0	1,192.0	$862	$781
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	10%	0.094	$60	$25	$209	$0	$0	$433	$262	$482	$520	0.6	1,192.6	$915	$782
Other	Delta	South Delta Improvements	65	$110	1	1	10%	0.094	$90	$0	$209	$0	$0	$450	$262	$482	$520	5.5	1,198.1	$932	$782
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$271	$482	$520	50.0	1,248.1	$962	$791
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$182	1	1	10%	0.164	$90	$0	$209	$0	$0	$507	$273	$482	$520	7.4	1,255.5	$989	$793
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	10%	0.094	$90	$25	$209	$0	$0	$563	$273	$482	$520	2.7	1,258.2	$1,045	$793
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$563	$275	$482	$520	7.1	1,265.3	$1,045	$795
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	10%	0.164	$90	$25	$209	$0	$0	$576	$276	$482	$520	5.9	1,271.2	$1,058	$796
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	10%	0.164	$90	$0	$209	$0	$0	$584	$277	$482	$520	1.3	1,272.5	$1,066	$797
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.154	$60	$25	$209	$0	$0	$598	$280	$482	$520	14.8	1,287.3	$1,080	$800
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.0625	$90	$0	$209	$0	$0	$600	$285	$482	$520	21.3	1,308.5	$1,082	$805
Additional options to the right of the demand function (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.112	$90	$0	$209	$0	$0	$600	$296	$482	$520	45.4	1,353.9	$1,082	$816
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$298	$482	$520	10.0	1,363.9	$1,082	$818
Land Fallow	San Joaquin	Range 1	12	$224	1	1	10%	0.164	$90	$25	$209	$0	$0	$603	$299	$482	$520	1.8	1,365.8	$1,085	$819
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$611	$299	$482	$520	1.2	1,366.8	$1,093	$819
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$613	$300	$482	$520	3.3	1,370.1	$1,095	$820
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$615	$300	$482	$520	3.8	1,373.9	$1,097	$820
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$301	$482	$520	2.0	1,375.9	$1,112	$821
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	10%	0.164	$90	$25	$209	$0	$0	$631	$302	$482	$520	5.9	1,381.8	$1,113	$822
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$631	$304	$482	$520	7.1	1,388.9	$1,113	$824
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$639	$305	$482	$520	3.3	1,392.2	$1,121	$825
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$644	$306	$482	$520	3.8	1,396.0	$1,126	$826
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$652	$306	$482	$520	3.0	1,399.0	$1,134	$826
Land Fallow	San Joaquin	Range 2	12	$279	1	1	10%	0.164	$90	$25	$209	$0	$0	$663	$307	$482	$520	1.8	1,400.7	$1,145	$827
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$670	$308	$482	$520	3.3	1,404.0	$1,152	$828
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$678	$309	$482	$520	3.8	1,407.8	$1,158	$829
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$319	$482	$520	39.0	1,446.8	$1,162	$839
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	10%	0.164	$90	$25	$209	$0	$0	$688	$320	$482	$520	5.9	1,452.7	$1,168	$840
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$698	$321	$482	$520	1.2	1,453.9	$1,180	$841
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$698	$321	$482	$520	3.0	1,456.9	$1,180	$841
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$700	$323	$482	$520	7.1	1,464.0	$1,182	$843
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$703	$324	$482	$520	3.3	1,467.3	$1,185	$844
Land Fallow	Sacramento	Range 12	32	$256	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$709	$325	$482	$520	3.8	1,471.1	$1,191	$845
Land Fallow	San Joaquin	Range 3	12	$336	1	1	10%	0.164	$90	$25	$209	$0	$0	$726	$325	$482	$520	1.8	1,472.8	$1,208	$845
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$734	$326	$482	$520	3.3	1,476.1	$1,216	$846
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$740	$327	$482	$520	3.8	1,479.9	$1,222	$847
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$745	$328	$482	$520	3.0	1,482.9	$1,227	$848
Land Fallow	Tulare	Range 1	67	$367	1	1	10%	0.164	$60	$25	$209	$0	$0	$749	$331	$482	$520	9.9	1,492.8	$1,231	$851
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$769	$333	$482	$520	7.1	1,499.8	$1,251	$853
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$793	$334	$482	$520	3.0	1,502.8	$1,275	$854
Land Fallow	San Joaquin	Range 4	12	$406	1	1	10%	0.164	$90	$25	$209	$0	$0	$802	$335	$482	$520	1.8	1,504.6	$1,284	$855
Land Fallow	Tulare	Range 2	67	$438	1	1	10%	0.164	$60	$25	$209	$0	$0	$805	$338	$482	$520	9.9	1,514.5	$1,287	$858
Land Fallow	Sacramento	Range 17	10	$355	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$844	$338	$482	$520	1.2	1,515.7	$1,326	$858
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	10%	0.164	$60	$25	$209	$0	$0	$848	$338	$482	$520	0.7	1,516.4	$1,328	$858
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$361	$482	$520	70.0	1,586.4	$1,332	$881
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$853	$362	$482	$520	3.0	1,589.3	$1,335	$882
Land Fallow	San Joaquin	Range 5	21	$452	1	1	10%	0.164	$90	$25	$209	$0	$0	$854	$363	$482	$520	3.1	1,592.4	$1,336	$883
Land Fallow	Tulare	Range 3	67	$490	1	1	10%	0.164	$60	$25	$209	$0	$0	$862	$366	$482	$520	9.9	1,602.3	$1,344	$886
Land Fallow	Tulare	Range 4	36	$492	1	1	10%	0.164	$60	$25	$209	$0	$0	$865	$368	$482	$520	5.3	1,607.6	$1,347	$888
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$393	$482	$520	85.0	1,692.6	$1,362	$913
Land Fallow	San Joaquin	Range 6	12	$483	1	1	10%	0.164	$90	$25	$209	$0	$0	$888	$394	$482	$520	1.8	1,694.4	$1,370	$914
Land Fallow	Tulare	Range 5	36	$540	1	1	10%	0.164	$60	$25	$209	$0	$0	$918	$395	$482	$520	5.3	1,699.7	$1,400	$915
Land Fallow	Tulare	Range 6	67	$542	1	1	10%	0.164	$60	$25	$209	$0	$0	$919	$398	$482	$520	9.9	1,709.6	$1,401	$918
Land Fallow	San Joaquin	Range 7	21	$522	1	1	10%	0.164	$90	$25	$209	$0	$0	$930	$399	$482	$520	3.1	1,712.7	$1,412	$919
Land Fallow	Tulare	Range 7	36	$588	1	1	10%	0.164	$60	$25	$209	$0	$0	$971	$401	$482	$520	5.3	1,718.0	$1,453	$921
Land Fallow	Tulare	Range 8	67	$594	1	1	10%	0.164	$60	$25	$209	$0	$0	$976	$404	$482	$520	9.9	1,727.9	$1,458	$924
Land Fallow	Tulare	Range 9	19	$607	1	1	10%	0.164	$60	$25	$209	$0	$0	$991	$405	$482	$520	2.8	1,730.7	$1,473	$925
Land Fallow	San Joaquin	Range 8	21	$690	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,005	$406	$482	$520	3.1	1,733.8	$1,487	$926
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$409	$482	$520	7.0	1,740.8	$1,487	$929

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Table 11

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DELTA EXPORTERS PREFERENCE SET
SAN FRANCISCO BAY REGION

Option			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Measure	Q_S Quantity (TAF/year)	C_S Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_B Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Land Fallow	Tulare	Range 10	36	$635	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,022	$411	$482	$520	5.3	1,746.1	$1,504	$931
Land Fallow	Tulare	Range 11	19	$648	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,037	$412	$482	$520	2.8	1,748.9	$1,519	$932
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$1,057	$412	$482	$520	1.2	1,750.1	$1,539	$932
Land Fallow	Tulare	Range 12	36	$663	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,075	$414	$482	$520	5.3	1,755.4	$1,557	$934
Land Fallow	Tulare	Range 13	19	$668	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,081	$415	$482	$520	2.8	1,758.2	$1,563	$935
Land Fallow	San Joaquin	Range 9	21	$659	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,081	$416	$482	$520	3.1	1,761.3	$1,563	$936
Land Fallow	San Joaquin	Range 10	13	$694	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,119	$417	$482	$520	1.9	1,763.3	$1,601	$937
Land Fallow	Tulare	Range 14	19	$730	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,126	$418	$482	$520	2.8	1,766.1	$1,608	$938
Land Fallow	San Joaquin	Range 11	21	$728	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,158	$420	$482	$520	3.1	1,769.2	$1,640	$940
Land Fallow	San Joaquin	Range 12	13	$734	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,163	$420	$482	$520	1.9	1,771.1	$1,645	$940
Land Fallow	Tulare	Range 15	19	$771	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,172	$422	$482	$520	2.8	1,773.9	$1,654	$942
Land Fallow	San Joaquin	Range 13	13	$776	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,209	$422	$482	$520	1.9	1,775.8	$1,691	$942
Land Fallow	San Joaquin	Range 14	13	$815	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,253	$423	$482	$520	1.9	1,777.7	$1,735	$943
Land Fallow	Sacramento	Range 20	10	$668	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$1,272	$424	$482	$520	1.2	1,778.9	$1,754	$944
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1	1	10%	0.164	$90	$0	$209	$0	$0	$1,293	$446	$482	$520	45.8	1,824.7	$1,775	$966
Land Fallow	San Joaquin	Range 15	13	$856	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,298	$447	$482	$520	1.9	1,826.6	$1,780	$967
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,368	$447	$482	$520	0.7	1,827.3	$1,850	$967
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develop.	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$476	$482	$520	50.0	1,877.3	$2,012	$996
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$496	$482	$520	28.0	1,905.3	$2,362	$1,016
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,973	$501	$482	$520	6.5	1,911.8	$2,465	$1,021
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	10%	0.164	$90	$25	$209	$0	$0	$2,006	$502	$482	$520	1.0	1,912.8	$2,488	$1,022
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	10%	0.16	$90	$25	$209	$0	$0	$2,419	$504	$482	$520	1.8	1,914.6	$2,901	$1,024

D-013543

D—013543

D-013544

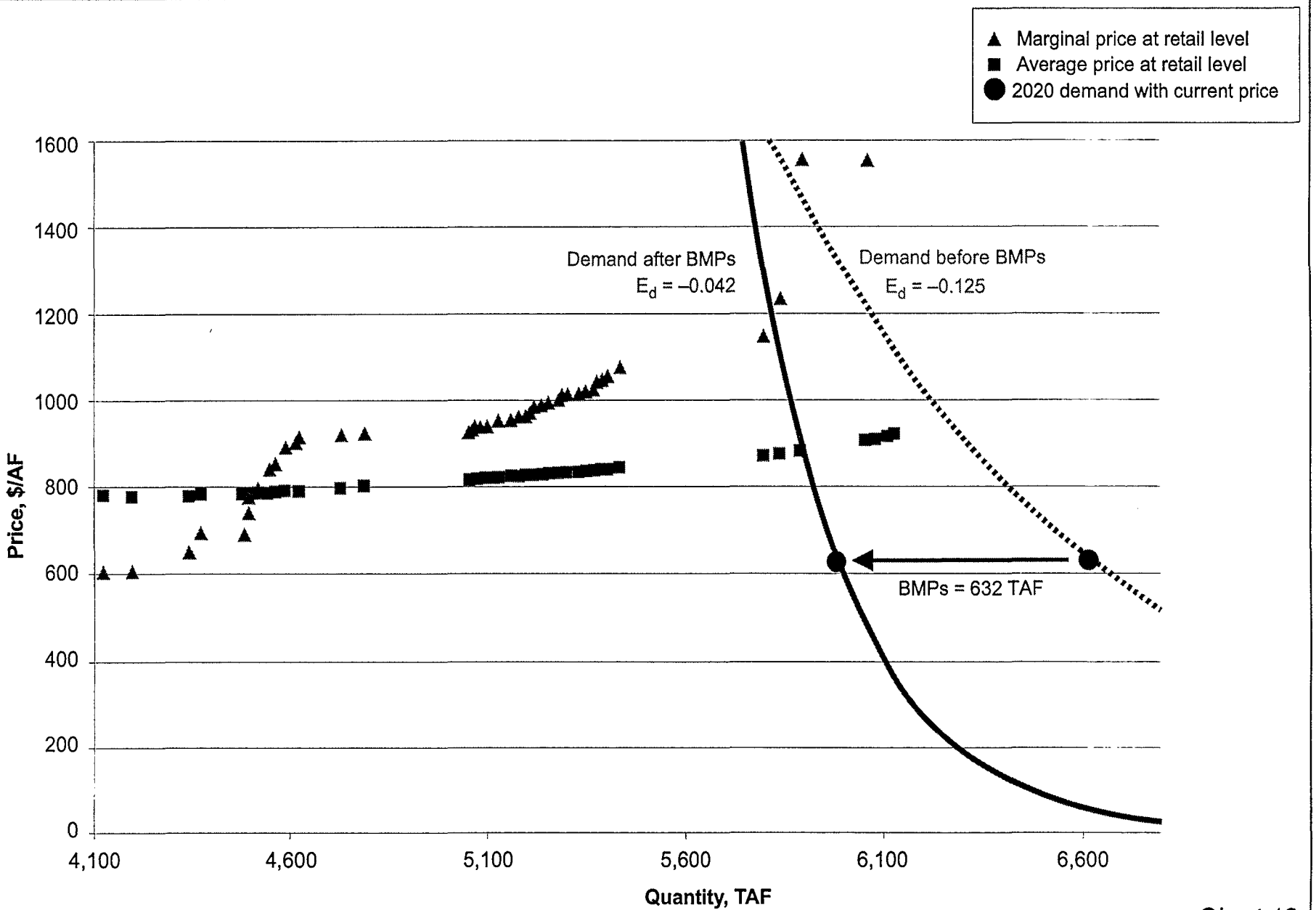

Chart 12
Screening Level Analysis
Urban Delta Exporters Preference Set
South Coast Region

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Table 12
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DELTA EXPORTERS PREFERENCE SET
SOUTH COAST REGION

Option			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination			
																				Retail Price Using:	
Type	Location	Measure	Q_0 Quantity (TAF/year)	C_0 Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_0 Marginal Cost at Retail	P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$281	$325	$500	24.0	3995.9	$486	$781
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$279	$325	$500	70.9	4,066.7	$531	$779
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$279	$325	$500	7.6	4,074.4	$554	$779
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$279	$325	$500	20.7	4,095.1	$605	$779
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$279	$325	$500	28.3	4,123.4	$605	$779
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$279	$325	$500	74.1	4,197.5	$605	$779
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$281	$325	$500	141.7	4,339.2	$646	$781
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$281	$325	$500	29.4	4,368.7	$692	$781
Urban Recycling	South Coast	Range 1	100	$600	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$283	$325	$500	109.0	4,477.7	$692	$783
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$284	$325	$500	10.9	4,488.6	$738	$784
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$209	$0	$0	$448	$284	$325	$500	2.4	4,490.9	$773	$784
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.344	$140	$0	$209	$0	$0	$463	$285	$325	$500	21.9	4,512.9	$788	$785
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.09	1	10%	0.601	$140	$0	$209	$0	$0	$516	$286	$325	$500	29.5	4,542.3	$841	$786
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.344	$140	$25	$209	$0	$0	$529	$287	$325	$500	13.5	4,555.8	$854	$787
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	10%	0.601	$140	$25	$209	$0	$0	$567	$289	$325	$500	28.3	4,584.1	$892	$789
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	10%	0.601	$140	$25	$209	$0	$0	$579	$290	$325	$500	23.6	4,607.7	$904	$790
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est	9	$232	1.09	1	10%	0.601	$140	$0	$209	$0	$0	$586	$290	$325	$500	5.3	4,613.0	$911	$790
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$297	$325	$500	109.0	4,722.0	$921	$797
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	10%	0.601	$110	$25	$209	$0	$0	$599	$301	$325	$500	59.0	4,781.0	$924	$801
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1.09	1	10%	0.601	$140	$0	$209	$0	$0	$600	$317	$325	$500	265.3	5,046.3	$925	$817
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$604	$317	$325	$500	8.5	5,054.7	$929	$817
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$611	$318	$325	$500	5.6	5,060.4	$936	$818
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$613	$319	$325	$500	15.8	5,076.2	$938	$819
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$615	$320	$325	$500	18.0	5,094.2	$940	$820
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$630	$321	$325	$500	28.2	5,122.4	$955	$821
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$630	$323	$325	$500	33.8	5,156.2	$955	$823
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$637	$324	$325	$500	15.8	5,172.0	$962	$824
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$642	$325	$325	$500	18.0	5,190.0	$967	$825
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$648	$326	$325	$500	14.2	5,204.2	$973	$826
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$659	$327	$325	$500	8.5	5,212.6	$984	$827
Land Fallow	Sacramento	Range 7	28	$226	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$665	$328	$325	$500	15.8	5,228.4	$990	$828
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$670	$329	$325	$500	18.0	5,246.4	$995	$829
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$680	$331	$325	$500	28.2	5,274.6	$1,005	$831
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$690	$331	$325	$500	5.7	5,280.3	$1,015	$831
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$690	$332	$325	$500	14.2	5,294.5	$1,015	$832
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$693	$335	$325	$500	33.8	5,328.3	$1,018	$835
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$695	$336	$325	$500	15.8	5,344.1	$1,020	$836
Land Fallow	Sacramento	Range 12	32	$256	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$701	$337	$325	$500	18.0	5,362.1	$1,026	$837
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$717	$338	$325	$500	8.5	5,370.6	$1,042	$838
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$724	$339	$325	$500	15.8	5,386.3	$1,049	$839
Land Fallow	Sacramento	Range 14	26	$279	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$729	$340	$325	$500	14.7	5,401.0	$1,054	$840
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$756	$342	$325	$500	33.8	5,434.8	$1,081	$842
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$828	$372	$325	$500	359.7	5,794.5	$1,151	$872
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$827	$373	$325	$500	3.5	5,798.0	$1,152	$873
Urban Recycling	South Coast	Range 3	37	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$376	$325	$500	40.3	5,838.3	$1,242	$876
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.09	1	10%	0.178	$140	$0	$209	$0	$0	$1,236	$384	$325	$500	54.1	5,892.5	$1,581	$884
Additional options to the right of the demand function (after BMPs)																					
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.09	1	10%	0.54	$140	$0	$209	$0	$0	$1,236	$407	$325	$500	164.2	6,056.7	$1,581	$907
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$410	$325	$500	20.7	6,077.4	$1,609	$910
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$1,306	$411	$325	$500	3.5	6,080.9	$1,631	$911
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$1,861	$418	$325	$500	31.0	6,111.9	$2,186	$918
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$1,891	$419	$325	$500	4.9	6,116.8	$2,216	$919
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$2,270	$422	$325	$500	8.5	6,125.3	$2,595	$922

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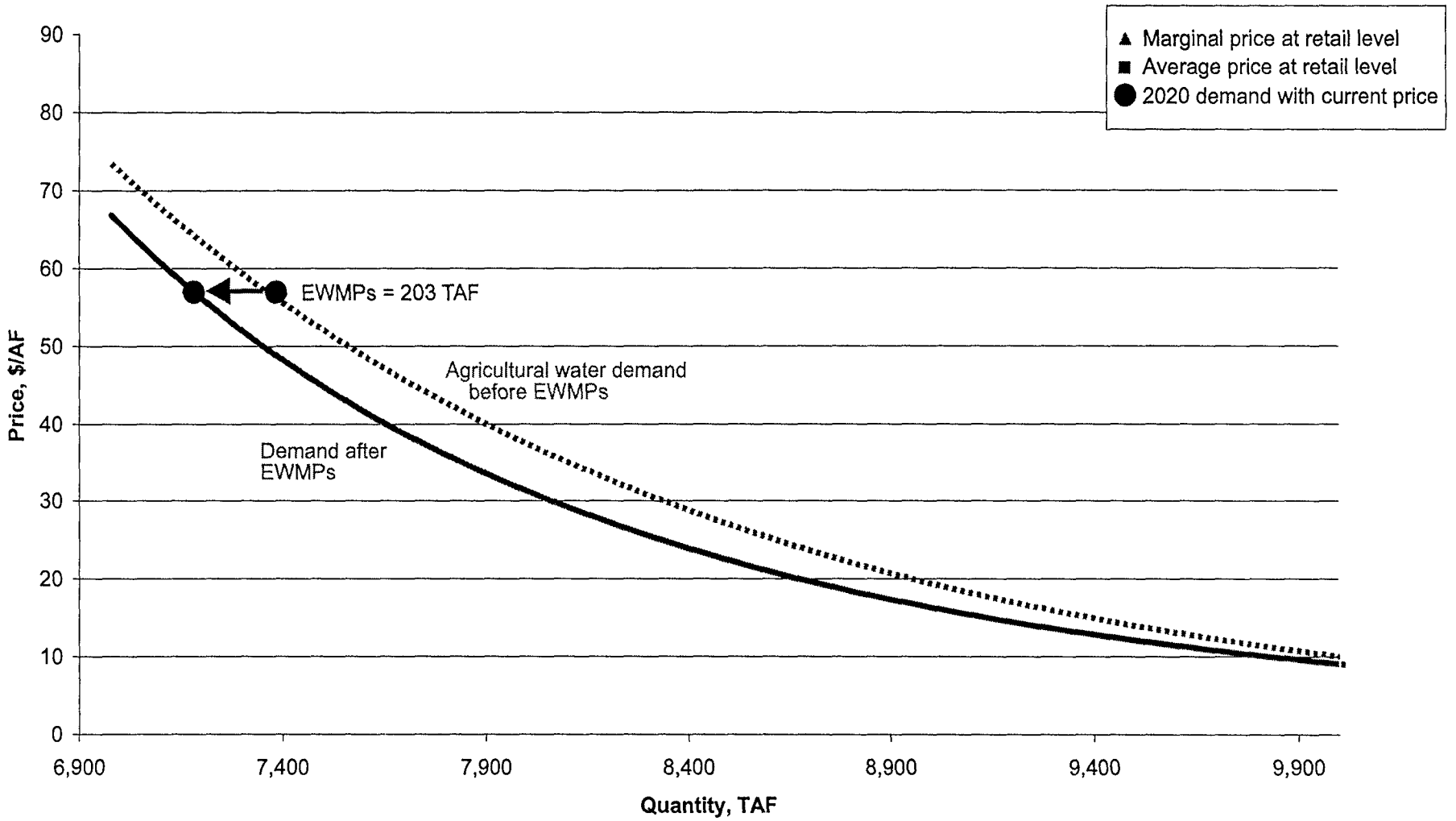

Chart 13
Screening Level Analysis
Urban Delta Exporters Preference Set
Sacramento River Region

D-013547

Table 13

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DELTA EXPORTERS PREFERENCE SET
SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

Options screened to meet demand

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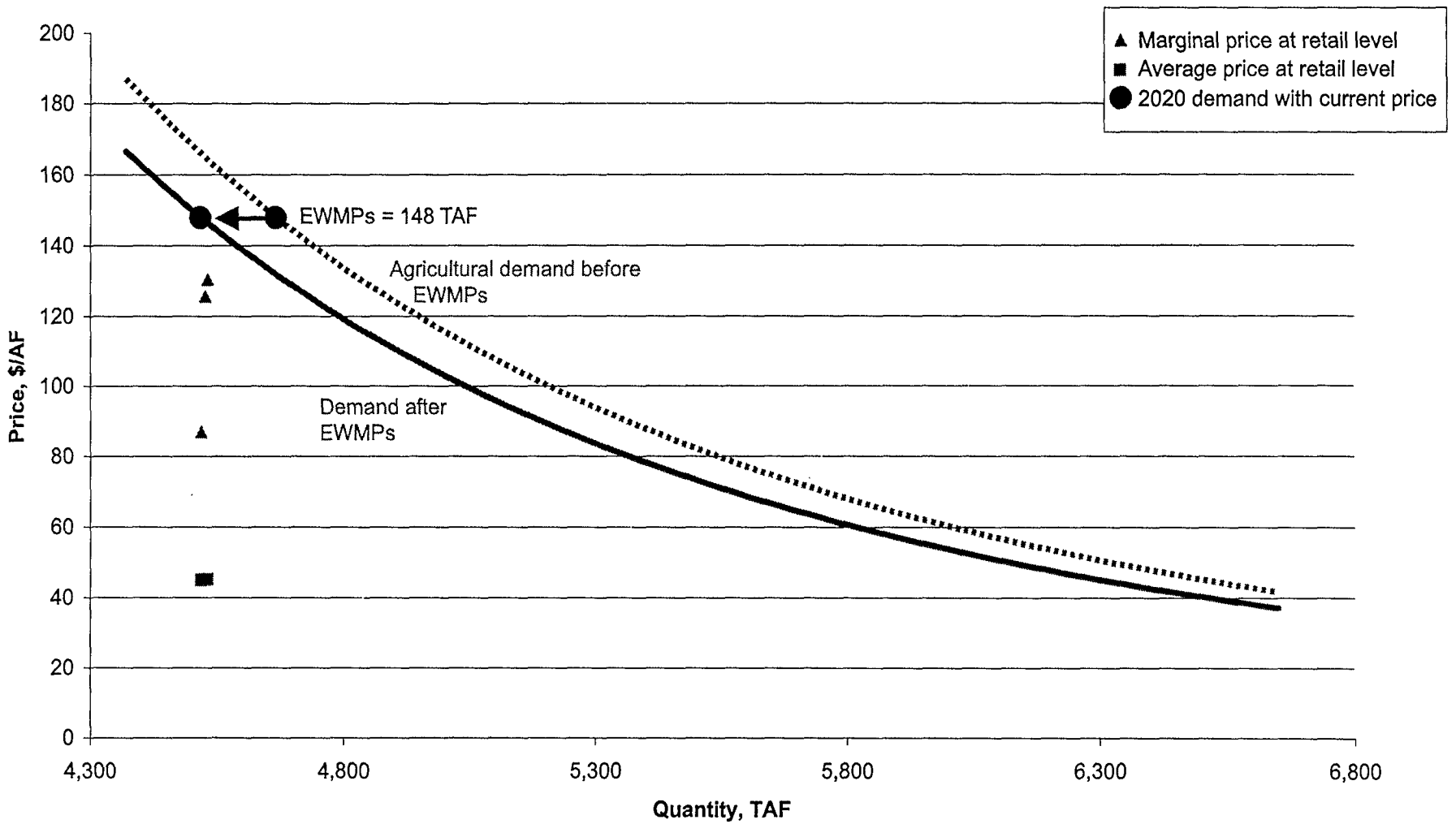

Chart 14
Screening Level Analysis
Urban Delta Exporters Preference Set
San Joaquin River Region

D—013548

D-013549

Table 14

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS URBAN DELTA EXPORTERS PREFERENCE SET
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
												4518		45
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	*South Delta Improvements*	65	$110	1.15	1	0.106	$30	$0	7.9	$126	4,527	$126	$45.15
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.106	$0	$0	4.9	$130	4,532	$130	$45.24

D—013549

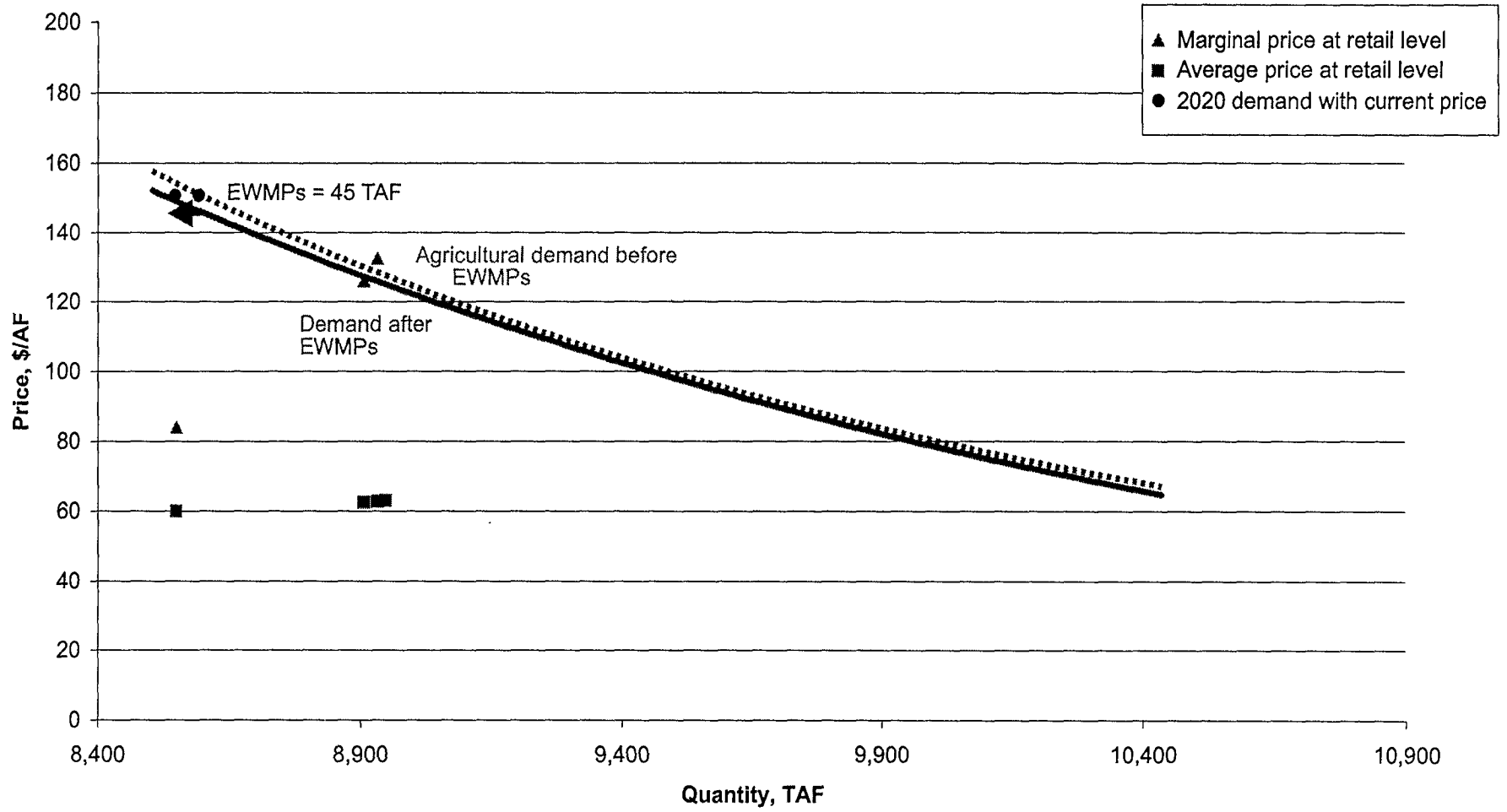

Chart 15
Screening Level Analysis
Urban Delta Exporters Preference Set
Tulare Lake Region

Table 15

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DELTA EXPORTERS PREFERENCE SET
TULARE LAKE REGION

Option			At Source (dry condition)							At Destinaton				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,907	$126	$62.65
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,932	$132	$62.85
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0.322	$60	$25	15.3	$211	8,947	$211	$63.10

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D-013552

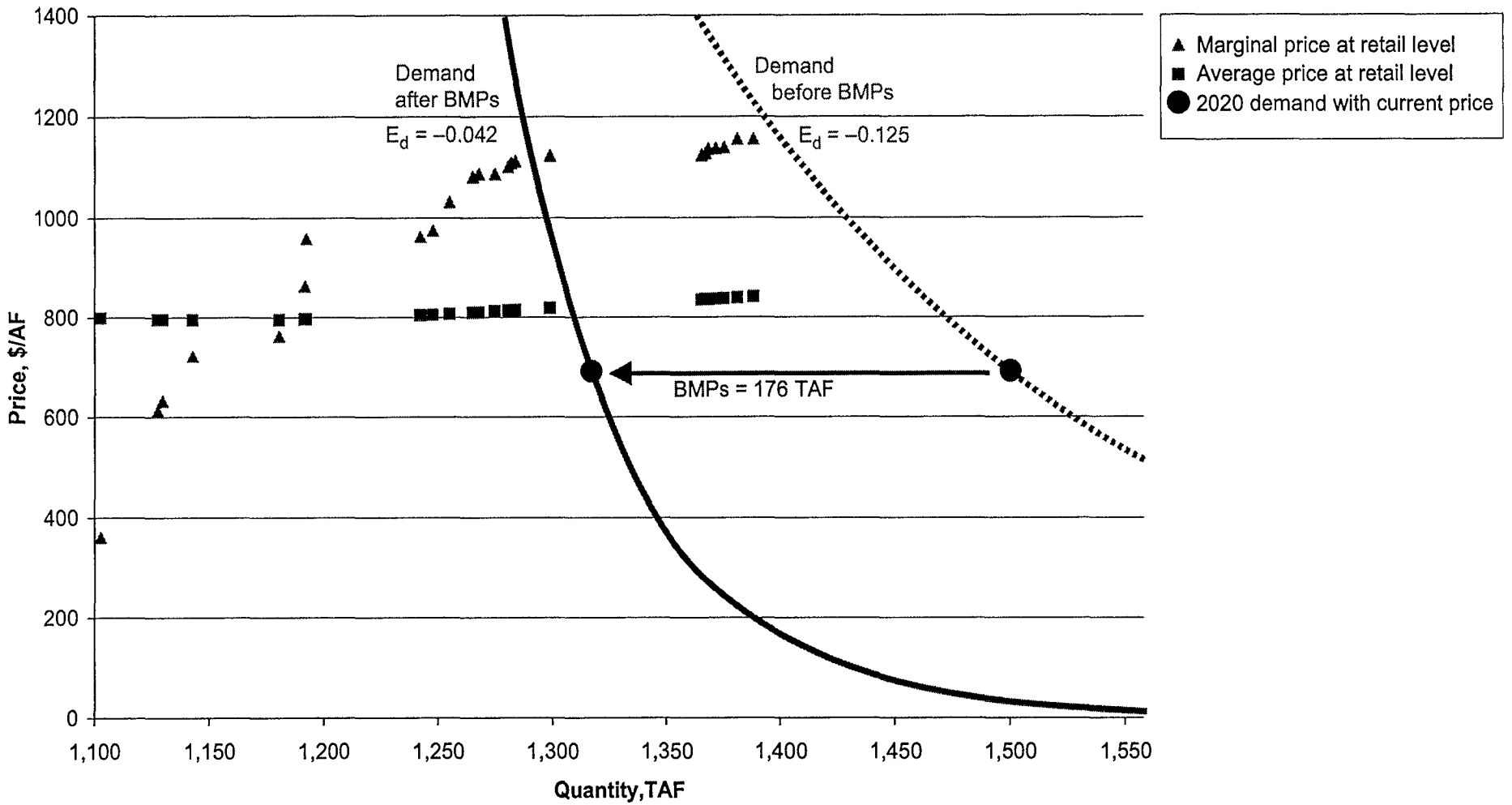

Chart 16
Screening Level Analysis
Urban In-Delta Diverters Preference Set
San Francisco Bay Region

D—013552

Table 16

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN IN-DELTA DIVERTERS PREFERENCE SET
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_0 Quantity (TAF/year)	At Source (dry condition) C_0 Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_c Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive P_M Marginal Unit Cost $/AF	Retail Cost Additive P_M Average Unit Cost $/AF	At Destination Q_D Retail Quantity (TAF/year)	At Destination Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$279	$482	$520	25.0	1103.0	$362	$799
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$276	$482	$520	25.0	1,128.0	$612	$796
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$275	$482	$520	2.0	1,130.0	$632	$795
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$275	$482	$520	13.0	1,143.0	$722	$795
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$275	$482	$520	38.0	1,181.0	$762	$795
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$276	$482	$520	11.0	1,192.0	$862	$796
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	10%	0.094	$60	$25	$248	$0	$0	$476	$276	$482	$520	0.6	1,192.6	$958	$796
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$284	$482	$520	50.0	1,242.6	$962	$804
Other	Delta	South Delta Improvements	65	$110	1	1	10%	0.094	$90	$0	$248	$0	$0	$493	$285	$482	$520	5.5	1,248.1	$975	$806
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1	1	10%	0.164	$90	$0	$248	$0	$0	$550	$287	$482	$520	7.4	1,255.5	$1,032	$807
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$289	$482	$520	10.0	1,265.5	$1,082	$809
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	10%	0.094	$90	$25	$248	$0	$0	$606	$290	$482	$520	2.7	1,268.2	$1,088	$810
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$606	$292	$482	$520	7.1	1,275.3	$1,088	$812
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	10%	0.164	$90	$25	$248	$0	$0	$619	$293	$482	$520	5.9	1,281.2	$1,101	$813
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	10%	0.164	$90	$0	$248	$0	$0	$627	$294	$482	$520	1.3	1,282.5	$1,109	$814
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$294	$482	$520	2.0	1,284.5	$1,112	$814
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.164	$60	$25	$248	$0	$0	$641	$298	$482	$520	14.8	1,299.3	$1,123	$818
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.02	$90	$0	$248	$0	$0	$642	$300	$482	$520	8.1	1,307.4	$1,124	$820
Additional options to the right of the demand function (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.144	$90	$0	$248	$0	$0	$642	$313	$482	$520	58.3	1,365.7	$1,124	$833
Land Fallow	San Joaquin	Range 1	12	$224	1	1	10%	0.164	$90	$25	$248	$0	$0	$646	$313	$482	$520	1.8	1,367.4	$1,128	$833
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$654	$314	$482	$520	1.2	1,368.6	$1,136	$834
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$656	$314	$482	$520	3.3	1,371.9	$1,138	$834
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$658	$315	$482	$520	3.8	1,375.7	$1,140	$835
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	10%	0.164	$90	$25	$248	$0	$0	$674	$317	$482	$520	5.9	1,381.6	$1,156	$837
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$674	$319	$482	$520	7.1	1,388.7	$1,156	$839
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$329	$482	$520	39.0	1,427.7	$1,162	$849
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$682	$329	$482	$520	3.3	1,431.0	$1,164	$849
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$687	$330	$482	$520	3.8	1,434.8	$1,169	$850
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$695	$331	$482	$520	3.0	1,437.8	$1,177	$851
Land Fallow	San Joaquin	Range 2	12	$279	1	1	10%	0.164	$90	$25	$248	$0	$0	$706	$332	$482	$520	1.8	1,439.5	$1,188	$852
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$713	$332	$482	$520	3.3	1,442.8	$1,195	$852
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$718	$333	$482	$520	3.8	1,446.6	$1,200	$853
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	10%	0.164	$90	$25	$248	$0	$0	$729	$335	$482	$520	5.9	1,452.5	$1,211	$855
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$335	$482	$520	1.2	1,453.7	$1,222	$855
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$336	$482	$520	3.0	1,456.7	$1,222	$856
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$743	$338	$482	$520	7.1	1,463.8	$1,225	$858
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$746	$339	$482	$520	3.3	1,467.1	$1,228	$859
Land Fallow	Sacramento	Range 12	32	$256	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$751	$340	$482	$520	3.8	1,470.9	$1,233	$860
Land Fallow	San Joaquin	Range 3	12	$336	1	1	10%	0.164	$90	$25	$248	$0	$0	$769	$341	$482	$520	1.8	1,472.6	$1,251	$861
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$777	$342	$482	$520	3.3	1,475.9	$1,259	$862
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$783	$343	$482	$520	3.8	1,479.7	$1,265	$863
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$788	$344	$482	$520	3.0	1,482.7	$1,270	$864
Land Fallow	Tulare	Range 1	67	$387	1	1	10%	0.164	$60	$25	$248	$0	$0	$792	$347	$482	$520	9.9	1,492.6	$1,274	$867
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$812	$349	$482	$520	7.1	1,499.6	$1,294	$869
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$836	$350	$482	$520	3.0	1,502.6	$1,318	$870
Land Fallow	San Joaquin	Range 4	12	$406	1	1	10%	0.164	$90	$25	$248	$0	$0	$845	$350	$482	$520	1.8	1,504.4	$1,327	$870
Land Fallow	Tulare	Range 2	67	$438	1	1	10%	0.164	$60	$25	$248	$0	$0	$848	$354	$482	$520	9.9	1,514.3	$1,330	$874
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$376	$482	$520	70.0	1,584.3	$1,332	$896
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$401	$482	$520	85.0	1,669.3	$1,362	$921
Land Fallow	Sacramento	Range 17	10	$355	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$887	$402	$482	$520	1.2	1,670.4	$1,369	$922
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	10%	0.164	$60	$25	$248	$0	$0	$889	$402	$482	$520	0.7	1,671.2	$1,371	$922
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$896	$403	$482	$520	3.0	1,674.1	$1,378	$923
Land Fallow	San Joaquin	Range 5	21	$452	1	1	10%	0.164	$90	$25	$248	$0	$0	$897	$404	$482	$520	3.1	1,677.2	$1,379	$924
Land Fallow	Tulare	Range 3	67	$490	1	1	10%	0.164	$60	$25	$248	$0	$0	$905	$407	$482	$520	9.9	1,687.1	$1,387	$927
Land Fallow	Tulare	Range 4	36	$492	1	1	10%	0.164	$60	$25	$248	$0	$0	$908	$408	$482	$520	5.3	1,692.4	$1,390	$928
Land Fallow	San Joaquin	Range 6	12	$463	1	1	10%	0.164	$90	$25	$248	$0	$0	$930	$409	$482	$520	1.8	1,694.2	$1,412	$929
Land Fallow	Tulare	Range 5	36	$540	1	1	10%	0.164	$60	$25	$248	$0	$0	$961	$410	$482	$520	5.3	1,699.5	$1,443	$930
Land Fallow	Tulare	Range 6	67	$542	1	1	10%	0.164	$60	$25	$248	$0	$0	$962	$414	$482	$520	9.9	1,709.4	$1,444	$934
Land Fallow	San Joaquin	Range 7	21	$522	1	1	10%	0.164	$90	$25	$248	$0	$0	$973	$415	$482	$520	3.1	1,712.5	$1,455	$935

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Table 16

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN IN-DELTA DIVERTERS PREFERENCE SET
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_o Quantity (TAF/year)	At Source (dry condition) C_o Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_c Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$417	$482	$520	7.0	1,719.5	$1,487	$937
Land Fallow	Tulare	Range 7	36	$588	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,013	$419	$482	$520	5.3	1,724.8	$1,495	$939
Land Fallow	Tulare	Range 8	67	$594	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,019	$422	$482	$520	9.9	1,734.7	$1,501	$942
Land Fallow	Tulare	Range 9	19	$607	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,034	$423	$482	$520	2.8	1,737.5	$1,516	$943
Land Fallow	San Joaquin	Range 8	21	$590	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,048	$424	$482	$520	3.1	1,740.6	$1,530	$944
Land Fallow	Tulare	Range 10	36	$635	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,065	$426	$482	$520	5.3	1,745.9	$1,547	$946
Land Fallow	Tulare	Range 11	19	$648	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,079	$427	$482	$520	2.8	1,748.7	$1,561	$947
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,100	$428	$482	$520	1.2	1,749.9	$1,582	$948
Land Fallow	Tulare	Range 12	36	$683	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,118	$430	$482	$520	5.3	1,755.2	$1,600	$950
Land Fallow	Tulare	Range 13	19	$688	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,123	$431	$482	$520	2.8	1,758.0	$1,605	$951
Land Fallow	San Joaquin	Range 9	21	$659	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,124	$432	$482	$520	3.1	1,761.1	$1,606	$952
Land Fallow	San Joaquin	Range 10	13	$694	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,162	$433	$482	$520	1.9	1,763.1	$1,644	$953
Land Fallow	Tulare	Range 14	19	$730	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,169	$434	$482	$520	2.8	1,765.9	$1,651	$954
Land Fallow	San Joaquin	Range 11	21	$728	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,201	$436	$482	$520	3.1	1,769.0	$1,683	$956
Land Fallow	San Joaquin	Range 12	13	$734	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,206	$436	$482	$520	1.9	1,770.9	$1,688	$956
Land Fallow	Tulare	Range 15	19	$771	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,214	$438	$482	$520	2.8	1,773.7	$1,696	$958
Land Fallow	San Joaquin	Range 13	13	$775	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,252	$438	$482	$520	1.9	1,775.6	$1,734	$958
Land Fallow	San Joaquin	Range 14	13	$815	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,296	$439	$482	$520	1.9	1,777.5	$1,778	$959
Land Fallow	Sacramento	Range 20	10	$666	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,315	$440	$482	$520	1.2	1,778.7	$1,797	$960
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1	1	10%	0.164	$90	$0	$248	$0	$0	$1,335	$462	$482	$520	45.8	1,824.5	$1,817	$982
Land Fallow	San Joaquin	Range 15	13	$858	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,341	$463	$482	$520	1.9	1,826.4	$1,823	$983
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,411	$484	$482	$520	0.7	1,827.1	$1,893	$984
Urban WUE	S.F. Bay	Reduce outdoor use to 0.6 ET, exist. develop.	50	$1,850	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$492	$482	$520	50.0	1,877.1	$2,012	$1,012
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$513	$482	$520	28.0	1,905.1	$2,362	$1,033
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	10%	0.164	$60	$25	$248	$0	$0	$2,016	$518	$482	$520	6.5	1,911.6	$2,498	$1,038
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	10%	0.164	$90	$25	$248	$0	$0	$2,049	$518	$482	$520	1.0	1,912.6	$2,531	$1,038
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	10%	0.16	$90	$25	$248	$0	$0	$2,462	$520	$482	$520	1.8	1,914.4	$2,944	$1,040

D-013554

D—013554

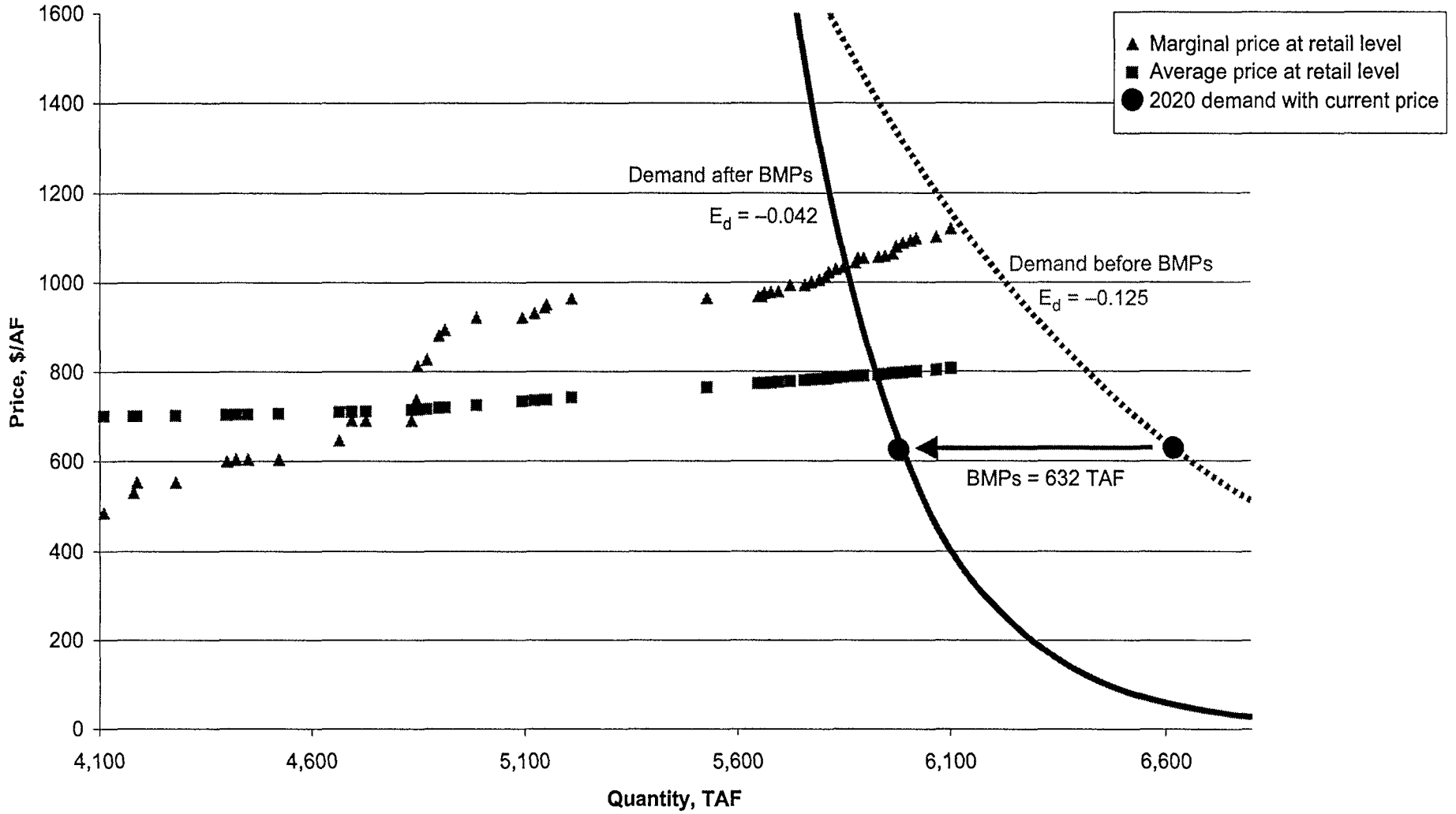

Chart 17
Screening Level Analysis
Urban In-Delta Diverters Preference Set
South Coast Region

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Table 17

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN IN-DELTA DIVERTERS PREFERENCE SET
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_o Quantity (TAF/year)	At Source (dry condition) C_o Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_c Transport Cost	C_T Transaction Fee, $/AF	C_q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
															$202.02				4087		
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$181	$202	$325	$500	24.0	4111.0	$486	$702
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$202	$325	$500	70.9	4,181.8	$531	$702
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$202	$325	$500	7.6	4,189.5	$554	$702
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$202	$325	$500	91.6	4,281.0	$554	$702
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$204	$325	$500	119.9	4,400.9	$600	$704
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$205	$325	$500	20.7	4,421.6	$605	$705
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$205	$325	$500	28.3	4,450.0	$605	$705
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$207	$325	$500	74.1	4,524.1	$605	$707
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$210	$325	$500	141.7	4,665.8	$646	$710
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$211	$325	$500	29.4	4,695.2	$692	$711
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$212	$325	$500	32.7	4,727.9	$692	$712
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$216	$325	$500	109.0	4,836.9	$692	$716
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$216	$325	$500	10.9	4,847.8	$738	$716
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$248	$0	$0	$487	$216	$325	$500	2.4	4,850.2	$812	$716
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.344	$140	$0	$248	$0	$0	$503	$217	$325	$500	21.9	4,872.1	$828	$717
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$555	$219	$325	$500	29.5	4,901.6	$880	$719
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.344	$140	$25	$248	$0	$0	$568	$220	$325	$500	13.5	4,915.1	$893	$720
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$226	$325	$500	73.0	4,988.1	$921	$726
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$234	$325	$500	109.0	5,097.1	$921	$734
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	10%	0.601	$140	$25	$248	$0	$0	$606	$236	$325	$500	28.3	5,125.4	$931	$736
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	10%	0.601	$140	$25	$248	$0	$0	$619	$238	$325	$500	23.6	5,149.0	$944	$738
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$626	$238	$325	$500	5.3	5,154.3	$951	$738
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	10%	0.601	$110	$25	$248	$0	$0	$639	$243	$325	$500	59.0	5,213.3	$964	$743
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$245	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$640	$265	$325	$500	317.0	5,530.2	$965	$765
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$273	$325	$500	119.9	5,650.1	$967	$773
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$643	$274	$325	$500	8.5	5,658.6	$968	$774
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$651	$274	$325	$500	5.6	5,664.2	$976	$774
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$652	$275	$325	$500	15.8	5,680.0	$977	$775
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$654	$277	$325	$500	18.0	5,698.0	$979	$777
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$669	$278	$325	$500	28.2	5,726.2	$994	$778
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$669	$281	$325	$500	33.8	5,760.0	$994	$781
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$676	$282	$325	$500	15.8	5,775.8	$1,001	$782
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$681	$283	$325	$500	18.0	5,793.8	$1,006	$783
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$688	$284	$325	$500	14.2	5,808.0	$1,013	$784
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$698	$285	$325	$500	8.5	5,816.5	$1,023	$785
Land Fallow	Sacramento	Range 7	28	$228	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$705	$286	$325	$500	15.8	5,832.2	$1,030	$786
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$710	$287	$325	$500	18.0	5,850.3	$1,035	$787
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$720	$289	$325	$500	28.2	5,878.4	$1,045	$789
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$290	$325	$500	5.7	5,884.1	$1,055	$790
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$291	$325	$500	14.2	5,898.3	$1,055	$791
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.45	$140	$25	$248	$0	$0	$732	$292	$325	$500	21.2	5,919.5	$1,057	$792
Additional options to the right of the demand function (after BMPs)																					
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.268	$140	$25	$248	$0	$0	$732	$292	$325	$500	12.6	5,910.9	$1,057	$792
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$735	$293	$325	$500	15.8	5,926.7	$1,060	$793
Land Fallow	Sacramento	Range 12	32	$256	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$740	$294	$325	$500	18.0	5,944.7	$1,065	$794
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$756	$295	$325	$500	8.5	5,953.2	$1,081	$795
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$763	$296	$325	$500	15.8	5,969.0	$1,088	$796
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$768	$297	$325	$500	18.0	5,987.0	$1,093	$797
Land Fallow	Sacramento	Range 15	25	$283	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$774	$299	$325	$500	14.1	6,001.1	$1,099	$799
Land Fallow	Tulare	Range 1	67	$387	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$777	$302	$325	$500	47.2	6,048.3	$1,102	$802
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$795	$305	$325	$500	33.8	6,082.1	$1,120	$805
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 16	25	$317	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$817	$306	$325	$500	14.2	6,096.3	$1,142	$806
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$335	$325	$500	359.7	6,456.0	$1,151	$835
Land Fallow	San Joaquin	Range 4	12	$406	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$826	$336	$325	$500	8.5	6,464.4	$1,151	$836
Land Fallow	Tulare	Range 2	67	$438	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$828	$339	$325	$500	47.2	6,511.6	$1,153	$839
Land Fallow	Sacramento	Range 17	10	$355	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$864	$340	$325	$500	5.6	6,517.3	$1,189	$840
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$866	$340	$325	$500	3.5	6,520.8	$1,191	$840
Land Fallow	Sacramento	Range 18	25	$362	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$873	$341	$325	$500	14.1	6,534.9	$1,198	$841
Land Fallow	San Joaquin	Range 5	21	$452	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$873	$342	$325	$500	14.8	6,549.7	$1,198	$842
Land Fallow	Tulare	Range 3	67	$490	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$881	$346	$325	$500	47.2	6,596.9	$1,206	$846

D—013556

Table 17

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN IN-DELTA DIVERTERS PREFERENCE SET
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_N Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination, Retail Price Using: P_D Marginal Cost at Retail	At Destination, Retail Price Using: P_D Average Cost at Retail
Land Fallow	Tulare	Range 4	36	$492	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$883	$348	$325	$500	25.4	6,622.2	$1,208	$848
Land Fallow	San Joaquin	Range 6	12	$483	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$904	$349	$325	$500	8.5	6,630.7	$1,229	$849
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$358	$325	$500	109.0	6,739.7	$1,242	$858
Land Fallow	Tulare	Range 5	36	$540	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$932	$360	$325	$500	25.4	6,765.0	$1,257	$860
Land Fallow	Tulare	Range 6	67	$542	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$933	$364	$325	$500	47.2	6,812.2	$1,258	$864
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$366	$325	$500	20.7	6,832.9	$1,265	$866
Land Fallow	San Joaquin	Range 7	21	$522	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$943	$367	$325	$500	14.8	6,847.7	$1,268	$867
Land Fallow	Tulare	Range 7	36	$588	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$980	$370	$325	$500	25.4	6,873.1	$1,305	$870
Land Fallow	Tulare	Range 8	67	$594	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$986	$374	$325	$500	47.2	6,920.3	$1,311	$874
Land Fallow	Tulare	Range 9	19	$607	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$999	$375	$325	$500	13.4	6,933.6	$1,324	$875
Land Fallow	San Joaquin	Range 8	21	$590	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,012	$376	$325	$500	14.8	6,948.4	$1,337	$876
Land Fallow	Tulare	Range 10	36	$635	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,027	$379	$325	$500	25.4	6,973.8	$1,352	$879
Land Fallow	Tulare	Range 11	19	$648	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,041	$380	$325	$500	13.4	6,987.2	$1,366	$880
Land Fallow	Sacramento	Range 19	10	$510	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,060	$381	$325	$500	5.6	6,992.8	$1,385	$881
Land Fallow	Tulare	Range 12	36	$683	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,076	$383	$325	$500	25.4	7,018.2	$1,401	$883
Land Fallow	Tulare	Range 13	19	$688	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,081	$384	$325	$500	13.4	7,031.6	$1,406	$884
Land Fallow	San Joaquin	Range 9	21	$659	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,082	$386	$325	$500	14.8	7,046.3	$1,407	$886
Land Fallow	San Joaquin	Range 10	13	$694	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,117	$387	$325	$500	9.2	7,055.5	$1,442	$887
Land Fallow	Tulare	Range 14	19	$730	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,123	$388	$325	$500	13.4	7,068.9	$1,448	$888
Land Fallow	San Joaquin	Range 11	21	$728	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,152	$390	$325	$500	14.8	7,083.7	$1,477	$890
Land Fallow	San Joaquin	Range 12	13	$734	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,157	$391	$325	$500	9.2	7,092.8	$1,482	$891
Land Fallow	Tulare	Range 15	19	$771	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,165	$392	$325	$500	13.4	7,106.2	$1,490	$892
Land Fallow	San Joaquin	Range 13	13	$775	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,199	$393	$325	$500	9.2	7,115.4	$1,524	$893
Land Fallow	San Joaquin	Range 14	13	$815	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,239	$394	$325	$500	9.2	7,124.5	$1,564	$894
Land Fallow	Sacramento	Range 20	10	$666	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,257	$395	$325	$500	5.6	7,130.2	$1,582	$895
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$1,276	$421	$325	$500	218.4	7,348.5	$1,601	$921
Land Fallow	San Joaquin	Range 15	13	$856	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,281	$422	$325	$500	9.2	7,357.7	$1,606	$922
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$425	$325	$500	20.7	7,378.4	$1,609	$925
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$437	$325	$500	109.0	7,487.4	$1,609	$937
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$488	$325	$500	474.2	7,961.5	$1,609	$988
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,345	$488	$325	$500	3.5	7,965.1	$1,670	$988
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,650	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$510	$325	$500	195.1	8,160.2	$1,747	$1,010
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$524	$325	$500	88.3	8,248.5	$2,068	$1,024
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,900	$529	$325	$500	31.0	8,279.4	$2,225	$1,029
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,931	$530	$325	$500	4.9	8,284.4	$2,256	$1,030
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$2,309	$531	$325	$500	8.5	8,292.8	$2,634	$1,031

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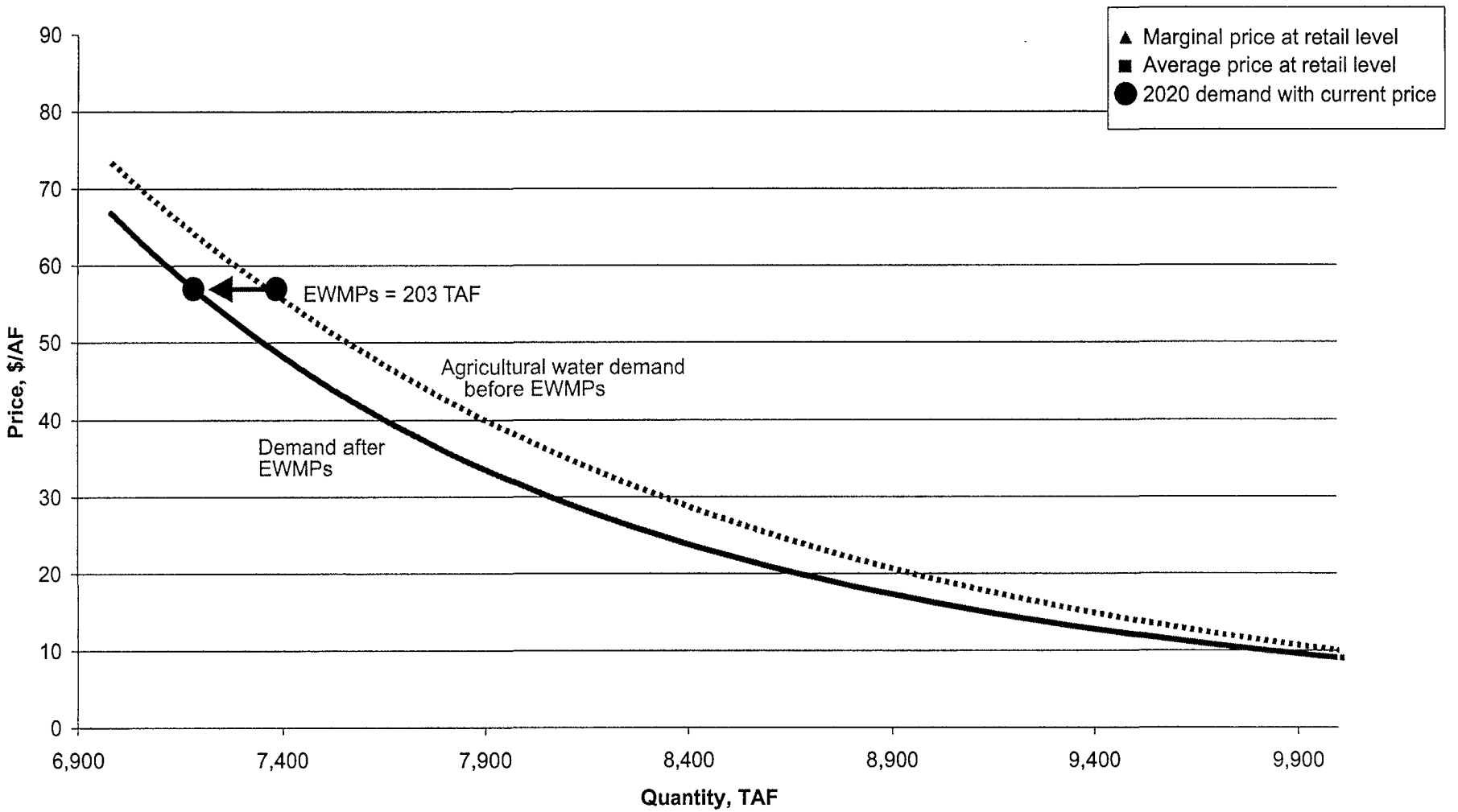

Chart 18
Screening Level Analysis
Urban In-Delta Diverters Preference Set
Sacramento River Region

D-013558

Table 18

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN IN-DELTA DIVERTERS PREFERENCE SET SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

Options screened to meet demand

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D—013559

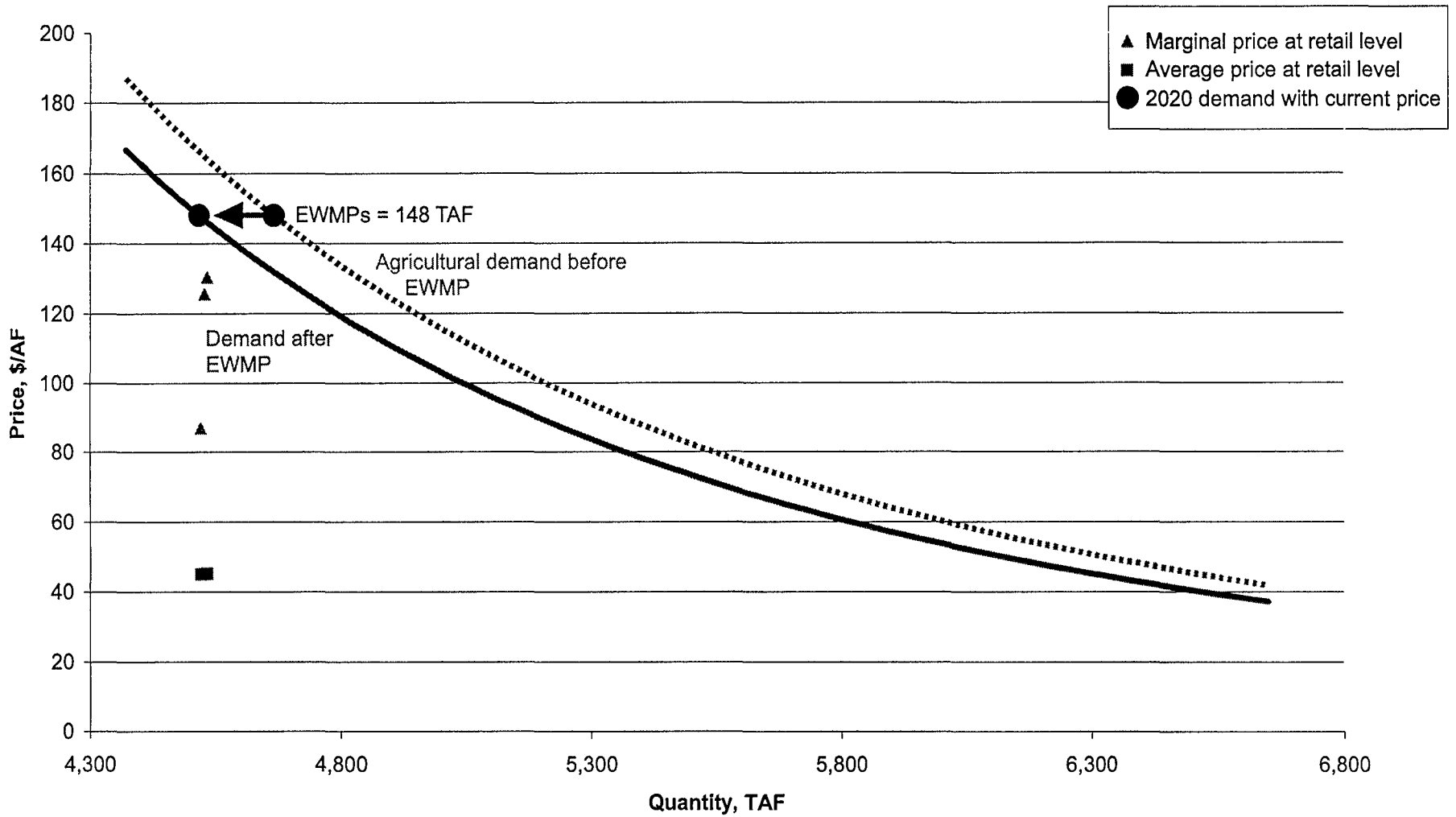

Chart 19
Screening Level Analysis
Urban In-Delta Diverters Preference Set
San Joaquin River Region

D-013560

D-013560

Table 19

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN IN-DELTA DIVERTERS PREFERENCE SET
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	South Delta Improvements	65	$110	1.15	1	0.106	$30	$0	7.9	$126	4,527	$126	$45.15
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.106	$0	$0	4.9	$130	4,532	$130	$45.24

D-013561

D—013561

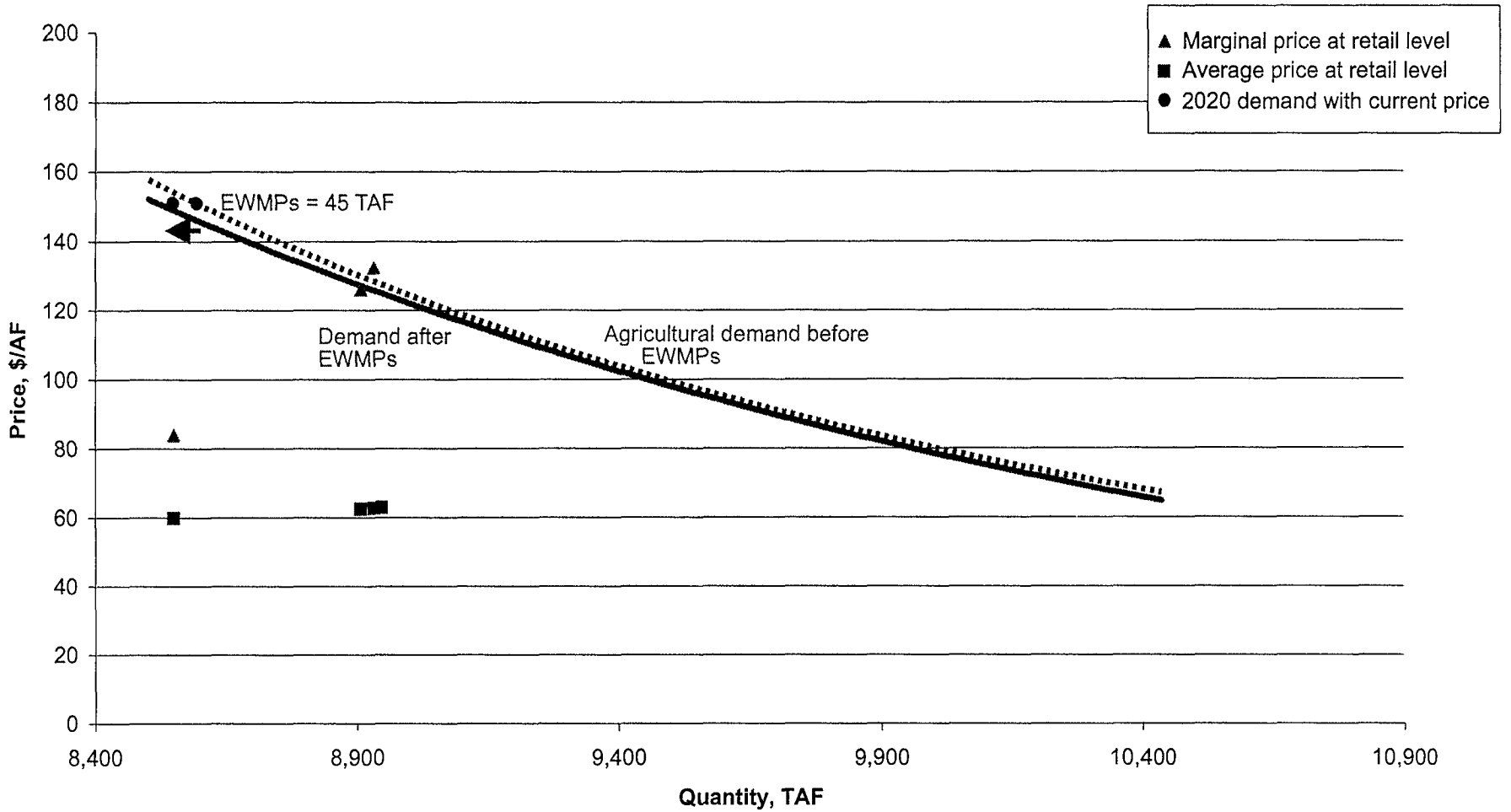

Chart 20
Screening Level Analysis
Urban In-Delta Diverters Preference Set
Tulare Lake Region

D-013562

Table 20

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN IN-DELTA DIVERTERS PREFERENCE SET TULARE LAKE REGION

Option			At Source (dry condition)							At Destination			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,907	$126	$62.65
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,932	$132	$62.85
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0.322	$60	$25	15.3	$211	8,947	$211	$63.10

D—013563

D-013564

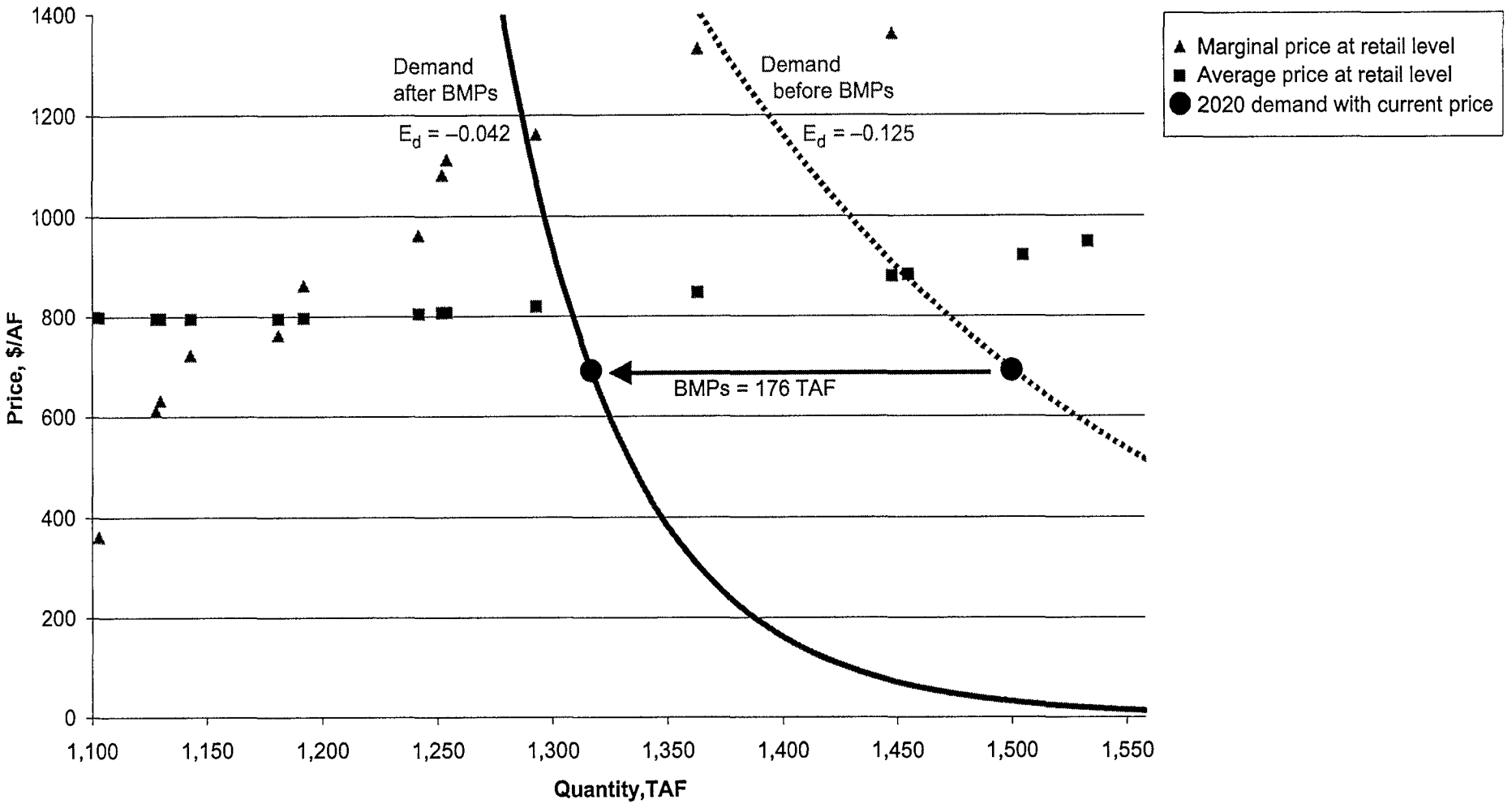

Chart 21
Screening Level Analysis
Delta Agriculture Preference Set
San Francisco Bay Region

D—013564

Table 21

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, DELTA AGRICULTURE PREFERENCE SET
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_o Quantity (TAF/year)	At Source (dry condition) C_o Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination: Retail Price Using: P_D Marginal Cost at Retail	At Destination: Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$279	$482	$520	25.0	1103.0	$362	$799
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$276	$482	$520	25.0	1128.0	$612	$796
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$275	$482	$520	2.0	1130.0	$632	$795
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$275	$482	$520	13.0	1143.0	$722	$795
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$275	$482	$520	38.0	1181.0	$762	$795
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$276	$482	$520	11.0	1192.0	$882	$796
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$284	$482	$520	50.0	1242.0	$962	$804
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$287	$482	$520	10.0	1252.0	$1,082	$807
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$287	$482	$520	2.0	1254.0	$1,112	$807
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$299	$482	$520	39.0	1293.0	$1,162	$819
Other	S.F. Bay	American River	70	$850	1	1	0%	0.2	$0	$0	$0	$0	$0	$850	$305	$482	$520	14.0	1307.0	$1,332	$825
Additional options to the right of the demand function (after BMPs)																					
Other	S.F. Bay	American River	70	$850	1	1	0%	0.8	$0	$0	$0	$0	$0	$850	$328	$482	$520	56.0	1363.0	$1,332	$848
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$360	$482	$520	85.0	1448.0	$1,362	$880
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$363	$482	$520	7.0	1455.0	$1,487	$883
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develop.	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$402	$482	$520	50.0	1505.0	$2,012	$922
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$429	$482	$520	28.0	1533.0	$2,362	$949
Additional options that meet screening criteria but are not selected on the basis of stated preferences																					
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	10%	0.094	$60	$25	$248	$0	$0	$476	$429	$482	$520	0.6	1,533.6	$958	$949
Other	Delta	South Delta Improvements	65	$110	1	1	10%	0.094	$90	$0	$248	$0	$0	$493	$429	$482	$520	5.5	1,539.1	$975	$949
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1	1	10%	0.164	$90	$0	$248	$0	$0	$550	$430	$482	$520	7.4	1,546.5	$1,032	$950
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	10%	0.094	$90	$25	$248	$0	$0	$606	$430	$482	$520	2.7	1,549.2	$1,088	$950
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$606	$431	$482	$520	7.1	1,556.3	$1,088	$951
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	10%	0.164	$90	$25	$248	$0	$0	$619	$432	$482	$520	5.9	1,562.2	$1,101	$952
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	10%	0.164	$90	$0	$248	$0	$0	$627	$432	$482	$520	1.3	1,563.5	$1,109	$952
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.164	$60	$25	$248	$0	$0	$641	$434	$482	$520	14.8	1,578.3	$1,123	$954
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1	1	10%	0.164	$90	$0	$248	$0	$0	$642	$442	$482	$520	66.4	1,644.7	$1,124	$962
Land Fallow	San Joaquin	Range 1	12	$224	1	1	10%	0.164	$90	$25	$248	$0	$0	$646	$442	$482	$520	1.8	1,646.4	$1,128	$962
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$654	$442	$482	$520	1.2	1,647.6	$1,136	$962
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$656	$443	$482	$520	3.3	1,650.9	$1,138	$963
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$658	$443	$482	$520	3.8	1,654.7	$1,140	$963
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	10%	0.164	$90	$25	$248	$0	$0	$674	$444	$482	$520	5.9	1,660.6	$1,156	$964
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$674	$445	$482	$520	7.1	1,667.7	$1,156	$965
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$682	$446	$482	$520	3.3	1,671.0	$1,164	$966
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$687	$446	$482	$520	3.8	1,674.8	$1,169	$966
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$695	$447	$482	$520	3.0	1,677.8	$1,177	$967
Land Fallow	San Joaquin	Range 2	12	$279	1	1	10%	0.164	$90	$25	$248	$0	$0	$706	$447	$482	$520	1.8	1,679.5	$1,188	$967
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$713	$447	$482	$520	3.3	1,682.8	$1,195	$967
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$718	$448	$482	$520	3.8	1,686.6	$1,200	$968
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	10%	0.164	$90	$25	$248	$0	$0	$729	$449	$482	$520	5.9	1,692.5	$1,211	$969
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$449	$482	$520	1.2	1,693.7	$1,222	$969
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$450	$482	$520	3.0	1,696.7	$1,222	$970
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$743	$451	$482	$520	7.1	1,703.8	$1,225	$971
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$746	$452	$482	$520	3.3	1,707.1	$1,228	$972
Land Fallow	Sacramento	Range 12	32	$256	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$751	$452	$482	$520	3.8	1,710.9	$1,233	$972
Land Fallow	San Joaquin	Range 3	12	$336	1	1	10%	0.164	$90	$25	$248	$0	$0	$769	$452	$482	$520	1.8	1,712.6	$1,251	$972
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$777	$453	$482	$520	3.3	1,715.9	$1,259	$973
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$783	$454	$482	$520	3.8	1,719.7	$1,265	$974
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$788	$454	$482	$520	3.0	1,722.7	$1,270	$974
Land Fallow	Tulare	Range 1	67	$387	1	1	10%	0.164	$60	$25	$248	$0	$0	$792	$458	$482	$520	9.9	1,732.6	$1,274	$976
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$812	$458	$482	$520	7.1	1,739.6	$1,294	$978
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$836	$458	$482	$520	3.0	1,742.6	$1,318	$978
Land Fallow	San Joaquin	Range 4	12	$406	1	1	10%	0.164	$90	$25	$248	$0	$0	$845	$459	$482	$520	1.8	1,744.4	$1,327	$979
Land Fallow	Tulare	Range 2	67	$438	1	1	10%	0.164	$60	$25	$248	$0	$0	$848	$461	$482	$520	9.9	1,754.3	$1,330	$981
Land Fallow	Sacramento	Range 17	10	$355	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$887	$461	$482	$520	1.2	1,755.4	$1,369	$981
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	10%	0.164	$60	$25	$248	$0	$0	$889	$461	$482	$520	0.7	1,756.2	$1,371	$981
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$896	$462	$482	$520	3.0	1,759.1	$1,378	$982
Land Fallow	San Joaquin	Range 5	21	$452	1	1	10%	0.164	$90	$25	$248	$0	$0	$897	$463	$482	$520	3.1	1,762.2	$1,379	$983
Land Fallow	Tulare	Range 3	67	$490	1	1	10%	0.164	$60	$25	$248	$0	$0	$905	$465	$482	$520	9.9	1,772.1	$1,387	$985
Land Fallow	Tulare	Range 4	36	$492	1	1	10%	0.164	$60	$25	$248	$0	$0	$908	$467	$482	$520	5.3	1,777.4	$1,390	$987
Land Fallow	San Joaquin	Range 6	12	$483	1	1	10%	0.164	$90	$25	$248	$0	$0	$930	$467	$482	$520	1.8	1,779.2	$1,412	$987
Land Fallow	Tulare	Range 5	36	$540	1	1	10%	0.164	$60	$25	$248	$0	$0	$961	$469	$482	$520	5.3	1,784.5	$1,443	$989

D-013565

D-013565

Table 21

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, DELTA AGRICULTURE PREFERENCE SET
SAN FRANCISCO BAY REGION

Option			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Measure	Q_s Quantity (TAF/year)	C_s Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_e Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Land Fallow	Tulare	Range 6	67	$542	1	1	10%	0.164	$60	$25	$248	$0	$0	$962	$471	$482	$520	9.9	1,794.4	$1,444	$991
Land Fallow	San Joaquin	Range 7	21	$522	1	1	10%	0.164	$90	$25	$248	$0	$0	$973	$472	$482	$520	3.1	1,797.5	$1,455	$992
Land Fallow	Tulare	Range 7	36	$558	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,013	$474	$482	$520	5.3	1,802.8	$1,495	$994
Land Fallow	Tulare	Range 8	67	$594	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,019	$477	$482	$520	9.9	1,812.7	$1,501	$997
Land Fallow	Tulare	Range 9	19	$607	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,034	$478	$482	$520	2.8	1,815.5	$1,516	$998
Land Fallow	San Joaquin	Range 8	21	$590	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,048	$479	$482	$520	3.1	1,818.6	$1,530	$999
Land Fallow	Tulare	Range 10	36	$635	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,065	$480	$482	$520	5.3	1,823.9	$1,547	$1,000
Land Fallow	Tulare	Range 11	19	$648	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,079	$481	$482	$520	2.8	1,826.7	$1,561	$1,001
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,100	$482	$482	$520	1.2	1,827.9	$1,582	$1,002
Land Fallow	Tulare	Range 12	36	$683	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,118	$484	$482	$520	5.3	1,833.2	$1,600	$1,004
Land Fallow	Tulare	Range 13	19	$688	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,123	$485	$482	$520	2.8	1,836.0	$1,605	$1,005
Land Fallow	San Joaquin	Range 9	21	$659	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,124	$486	$482	$520	3.1	1,839.1	$1,606	$1,006
Land Fallow	San Joaquin	Range 10	13	$694	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,162	$486	$482	$520	1.9	1,841.1	$1,644	$1,006
Land Fallow	Tulare	Range 14	19	$730	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,169	$487	$482	$520	2.8	1,843.9	$1,651	$1,007
Land Fallow	San Joaquin	Range 11	21	$728	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,201	$489	$482	$520	3.1	1,847.0	$1,683	$1,009
Land Fallow	San Joaquin	Range 12	13	$734	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,206	$489	$482	$520	1.9	1,848.9	$1,688	$1,009
Land Fallow	Tulare	Range 15	19	$771	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,214	$490	$482	$520	2.8	1,851.7	$1,696	$1,010
Land Fallow	San Joaquin	Range 13	13	$775	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,252	$491	$482	$520	1.9	1,853.6	$1,734	$1,011
Land Fallow	San Joaquin	Range 14	13	$815	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,296	$492	$482	$520	1.9	1,855.5	$1,778	$1,012
Land Fallow	Sacramento	Range 20	10	$656	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,315	$493	$482	$520	1.2	1,856.7	$1,797	$1,013
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1	1	10%	0.164	$90	$0	$248	$0	$0	$1,335	$513	$482	$520	45.8	1,902.5	$1,817	$1,033
Land Fallow	San Joaquin	Range 15	13	$856	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,341	$514	$482	$520	1.9	1,904.4	$1,823	$1,034
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,411	$514	$482	$520	0.7	1,905.1	$1,893	$1,034
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	10%	0.164	$60	$25	$248	$0	$0	$2,016	$519	$482	$520	6.5	1,911.6	$2,498	$1,039
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	10%	0.164	$90	$25	$248	$0	$0	$2,049	$520	$482	$520	1.0	1,912.6	$2,531	$1,040
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	10%	0.16	$90	$25	$248	$0	$0	$2,462	$522	$482	$520	1.8	1,914.4	$2,944	$1,042

D-013566

D—013566

D-013567

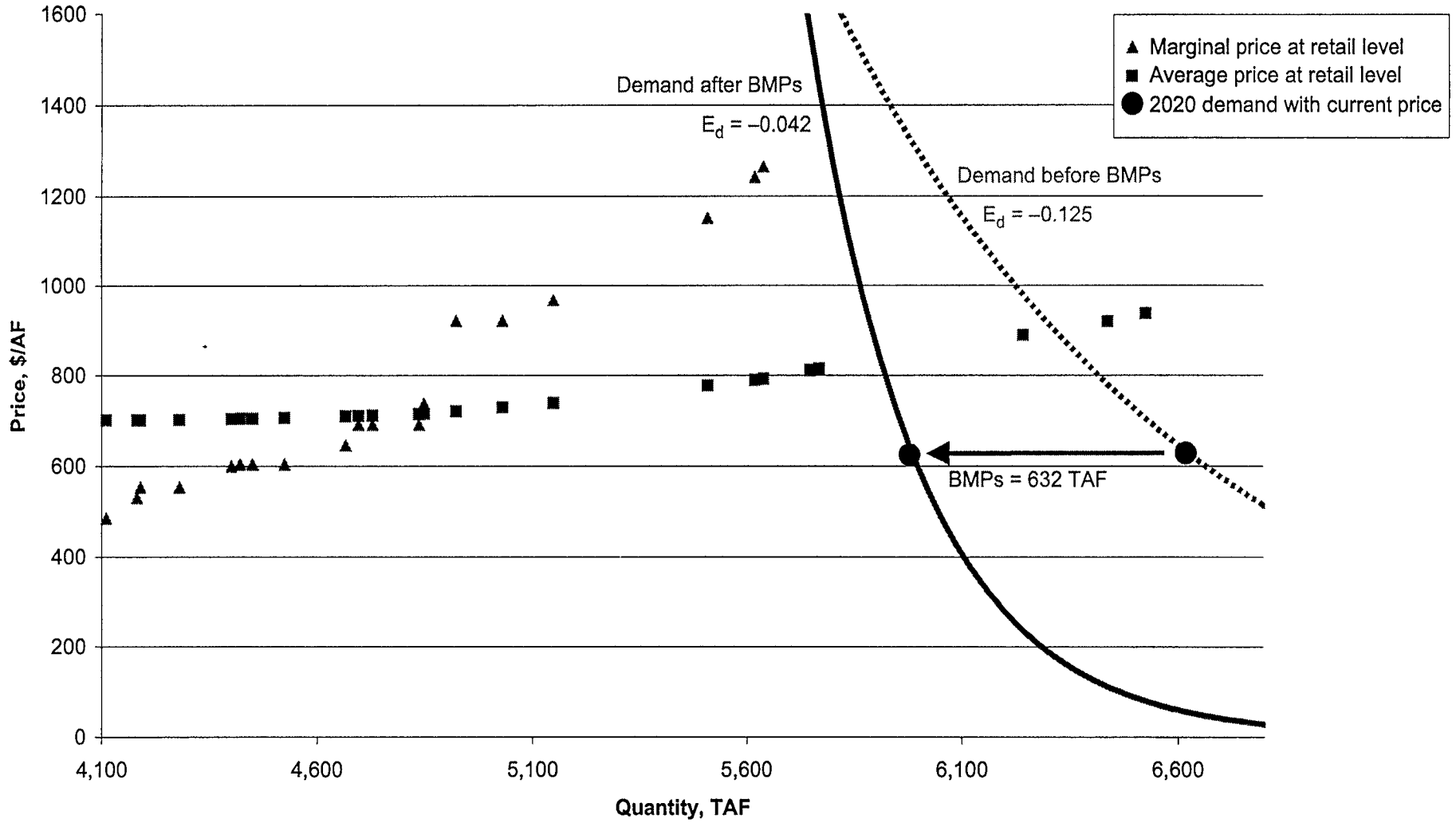

Chart 22
Screening Level Analysis
Delta Agriculture Preference Set
South Coast Region

D—013567

Table 22

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, DELTA AGRICULTURE PREFERENCE SET
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_D Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_S Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$202	$325	$500	24.0	4111.0	$486	$702
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$202	$325	$500	70.9	4,181.8	$531	$702
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$202	$325	$500	7.6	4,189.5	$554	$702
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$202	$325	$500	91.6	4,281.0	$554	$702
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$204	$325	$500	119.9	4,400.9	$600	$704
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$205	$325	$500	20.7	4,421.6	$605	$705
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$205	$325	$500	28.3	4,450.0	$605	$705
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$207	$325	$500	74.1	4,524.1	$605	$707
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$210	$325	$500	141.7	4,665.8	$646	$710
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$211	$325	$500	29.4	4,695.2	$692	$711
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$212	$325	$500	32.7	4,727.9	$692	$712
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$216	$325	$500	109.0	4,836.9	$692	$716
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$216	$325	$500	10.9	4,847.8	$738	$716
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$222	$325	$500	73.0	4,920.9	$921	$722
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$230	$325	$500	109.0	5,029.9	$921	$730
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$239	$325	$500	119.9	5,149.8	$967	$739
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$278	$325	$500	359.7	5,509.5	$1,151	$778
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$290	$325	$500	109.0	5,618.5	$1,242	$790
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$292	$325	$500	20.7	5,639.2	$1,265	$792
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$311	$325	$500	109.0	5,748.2	$1,609	$811
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$315	$325	$500	20.7	5,768.9	$1,609	$815
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	0.289	$0	$0	$0	-$100	$0	$1,284	$337	$325	$500	137.0	5,905.9	$1,609	$837
Additional options to the right of the demand function (after BMPs)																					
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	0.711	$0	$0	$0	-$100	$0	$1,284	$388	$325	$500	337.1	6,243.0	$1,609	$888
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,650	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$420	$325	$500	195.1	6,438.1	$1,747	$920
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$438	$325	$500	88.3	6,526.4	$2,068	$938
Additional options that meet screening criteria but are not selected on the basis of stated preferences																					
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$248	$0	$0	$487	$438	$325	$500	2.4	6,528.8	$812	$938
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.344	$140	$0	$248	$0	$0	$503	$438	$325	$500	21.9	6,550.7	$828	$938
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$555	$438	$325	$500	29.5	6,580.2	$880	$938
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.344	$140	$25	$248	$0	$0	$568	$439	$325	$500	13.5	6,593.7	$893	$939
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	10%	0.601	$140	$25	$248	$0	$0	$606	$439	$325	$500	28.3	6,622.0	$931	$939
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	10%	0.601	$140	$25	$248	$0	$0	$619	$440	$325	$500	23.6	6,645.6	$944	$940
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$626	$440	$325	$500	5.3	6,650.9	$951	$940
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	10%	0.601	$110	$25	$248	$0	$0	$639	$442	$325	$500	59.0	6,709.8	$964	$942
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$640	$451	$325	$500	317.0	7,026.8	$965	$951
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$643	$451	$325	$500	8.5	7,035.3	$968	$951
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$651	$451	$325	$500	5.6	7,040.9	$976	$951
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$652	$452	$325	$500	15.8	7,056.7	$977	$952
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$654	$452	$325	$500	18.0	7,074.7	$979	$952
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$669	$453	$325	$500	28.2	7,102.9	$994	$953
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$669	$454	$325	$500	33.8	7,136.7	$994	$954
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$676	$455	$325	$500	15.8	7,152.5	$1,001	$955
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$681	$455	$325	$500	18.0	7,170.5	$1,006	$955
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$688	$456	$325	$500	14.2	7,184.7	$1,013	$956
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$698	$456	$325	$500	8.5	7,193.1	$1,023	$956
Land Fallow	Sacramento	Range 7	28	$226	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$705	$456	$325	$500	15.8	7,208.9	$1,030	$956
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$710	$457	$325	$500	18.0	7,226.9	$1,035	$957
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$720	$458	$325	$500	28.2	7,255.1	$1,045	$958
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$458	$325	$500	5.7	7,260.8	$1,055	$958
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$459	$325	$500	14.2	7,275.0	$1,055	$959
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$732	$460	$325	$500	33.8	7,308.8	$1,057	$960
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$735	$461	$325	$500	15.8	7,324.6	$1,060	$961
Land Fallow	Sacramento	Range 12	32	$256	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$740	$461	$325	$500	18.0	7,342.6	$1,065	$961
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$756	$462	$325	$500	8.5	7,351.1	$1,081	$962
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$763	$462	$325	$500	15.8	7,366.8	$1,088	$962
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$768	$463	$325	$500	18.0	7,384.9	$1,093	$963
Land Fallow	Sacramento	Range 15	25	$283	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$774	$464	$325	$500	14.1	7,399.0	$1,099	$964
Land Fallow	Tulare	Range 1	67	$387	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$777	$466	$325	$500	47.2	7,446.2	$1,102	$966
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$795	$467	$325	$500	33.8	7,480.0	$1,120	$967
Land Fallow	Sacramento	Range 16	25	$317	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$817	$468	$325	$500	14.2	7,494.1	$1,142	$968

D-013568

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Table 22

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, DELTA AGRICULTURE PREFERENCE SET
SOUTH COAST REGION

			At Source (dry condition)												Retail Cost Additive		At Destination		Retail Price Using:	
													Unit Cost at Treatment Plant							
Type	Location	Option Measure	Q_o Quantity (TAF/year)	C_o Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_c Transport Cost	C_T Transaction Fee, $/AF	C_q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Land Fallow	San Joaquin	Range 4	12	$406	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$826	$468	$325	$500	8.5	7,502.6	$1,151	$968
Land Fallow	Tulare	Range 2	67	$438	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$828	$470	$325	$500	47.2	7,549.8	$1,153	$970
Land Fallow	Sacramento	Range 17	10	$355	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$864	$471	$325	$500	5.6	7,555.4	$1,189	$971
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$868	$471	$325	$500	3.5	7,558.9	$1,191	$971
Land Fallow	Sacramento	Range 18	25	$362	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$873	$472	$325	$500	14.1	7,573.0	$1,198	$972
Land Fallow	San Joaquin	Range 5	21	$452	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$873	$472	$325	$500	14.8	7,587.8	$1,198	$972
Land Fallow	Tulare	Range 3	67	$490	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$881	$475	$325	$500	47.2	7,635.0	$1,206	$975
Land Fallow	Tulare	Range 4	36	$492	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$883	$476	$325	$500	25.4	7,660.4	$1,208	$976
Land Fallow	San Joaquin	Range 6	12	$483	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$904	$477	$325	$500	8.5	7,668.8	$1,229	$977
Land Fallow	Tulare	Range 5	36	$540	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$932	$478	$325	$500	25.4	7,694.2	$1,257	$978
Land Fallow	Tulare	Range 6	67	$542	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$933	$481	$325	$500	47.2	7,741.4	$1,258	$981
Land Fallow	San Joaquin	Range 7	21	$522	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$943	$482	$325	$500	14.8	7,756.2	$1,268	$982
Land Fallow	Tulare	Range 7	36	$588	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$980	$484	$325	$500	25.4	7,781.5	$1,305	$984
Land Fallow	Tulare	Range 8	67	$594	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$986	$487	$325	$500	47.2	7,828.7	$1,311	$987
Land Fallow	Tulare	Range 9	19	$607	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$999	$487	$325	$500	13.4	7,842.1	$1,324	$987
Land Fallow	San Joaquin	Range 8	21	$590	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,012	$488	$325	$500	14.8	7,856.9	$1,337	$988
Land Fallow	Tulare	Range 10	36	$635	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,027	$490	$325	$500	25.4	7,882.2	$1,352	$990
Land Fallow	Tulare	Range 11	19	$648	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,041	$491	$325	$500	13.4	7,895.6	$1,366	$991
Land Fallow	Sacramento	Range 19	10	$510	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,060	$492	$325	$500	5.6	7,901.3	$1,385	$992
Land Fallow	Tulare	Range 12	36	$683	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,076	$493	$325	$500	25.4	7,926.6	$1,401	$993
Land Fallow	Tulare	Range 13	19	$688	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,081	$494	$325	$500	13.4	7,940.0	$1,406	$994
Land Fallow	San Joaquin	Range 9	21	$659	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,082	$496	$325	$500	14.8	7,954.8	$1,407	$996
Land Fallow	San Joaquin	Range 10	13	$694	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,117	$496	$325	$500	9.2	7,963.9	$1,442	$996
Land Fallow	Tulare	Range 14	19	$730	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,123	$497	$325	$500	13.4	7,977.3	$1,448	$997
Land Fallow	San Joaquin	Range 11	21	$728	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,152	$498	$325	$500	14.8	7,992.1	$1,477	$998
Land Fallow	San Joaquin	Range 12	13	$734	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,157	$499	$325	$500	9.2	8,001.3	$1,482	$999
Land Fallow	Tulare	Range 15	19	$771	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,165	$500	$325	$500	13.4	8,014.7	$1,490	$1,000
Land Fallow	San Joaquin	Range 13	13	$775	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,199	$501	$325	$500	9.2	8,023.8	$1,524	$1,001
Land Fallow	San Joaquin	Range 14	13	$815	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,239	$502	$325	$500	9.2	8,033.0	$1,564	$1,002
Land Fallow	Sacramento	Range 20	10	$666	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,257	$503	$325	$500	5.6	8,038.6	$1,582	$1,003
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$878	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$1,276	$523	$325	$500	218.4	8,257.0	$1,601	$1,023
Land Fallow	San Joaquin	Range 15	13	$858	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,281	$524	$325	$500	9.2	8,266.1	$1,606	$1,024
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,345	$524	$325	$500	3.5	8,269.6	$1,670	$1,024
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,900	$529	$325	$500	31.0	8,300.6	$2,225	$1,029
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,931	$530	$325	$500	4.9	8,305.6	$2,256	$1,030
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$2,309	$532	$325	$500	8.5	8,314.0	$2,634	$1,032

D-013569

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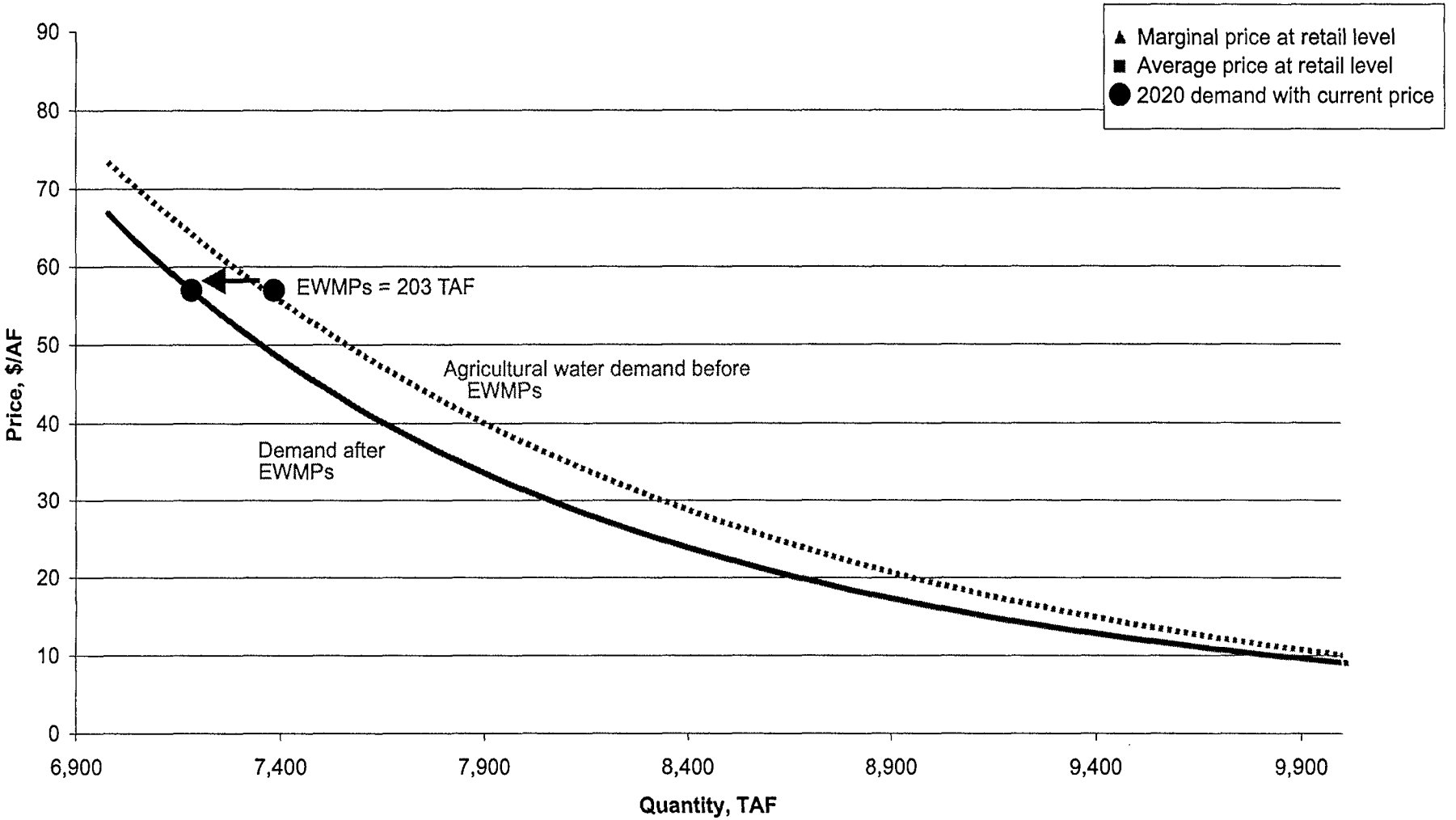

Chart 23
Screening Level Analysis
Delta Agriculture Preference Set
Sacramento River Region

Table 23

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, DELTA AGRICULTURE PREFERENCE SET SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

Options screened to meet demand

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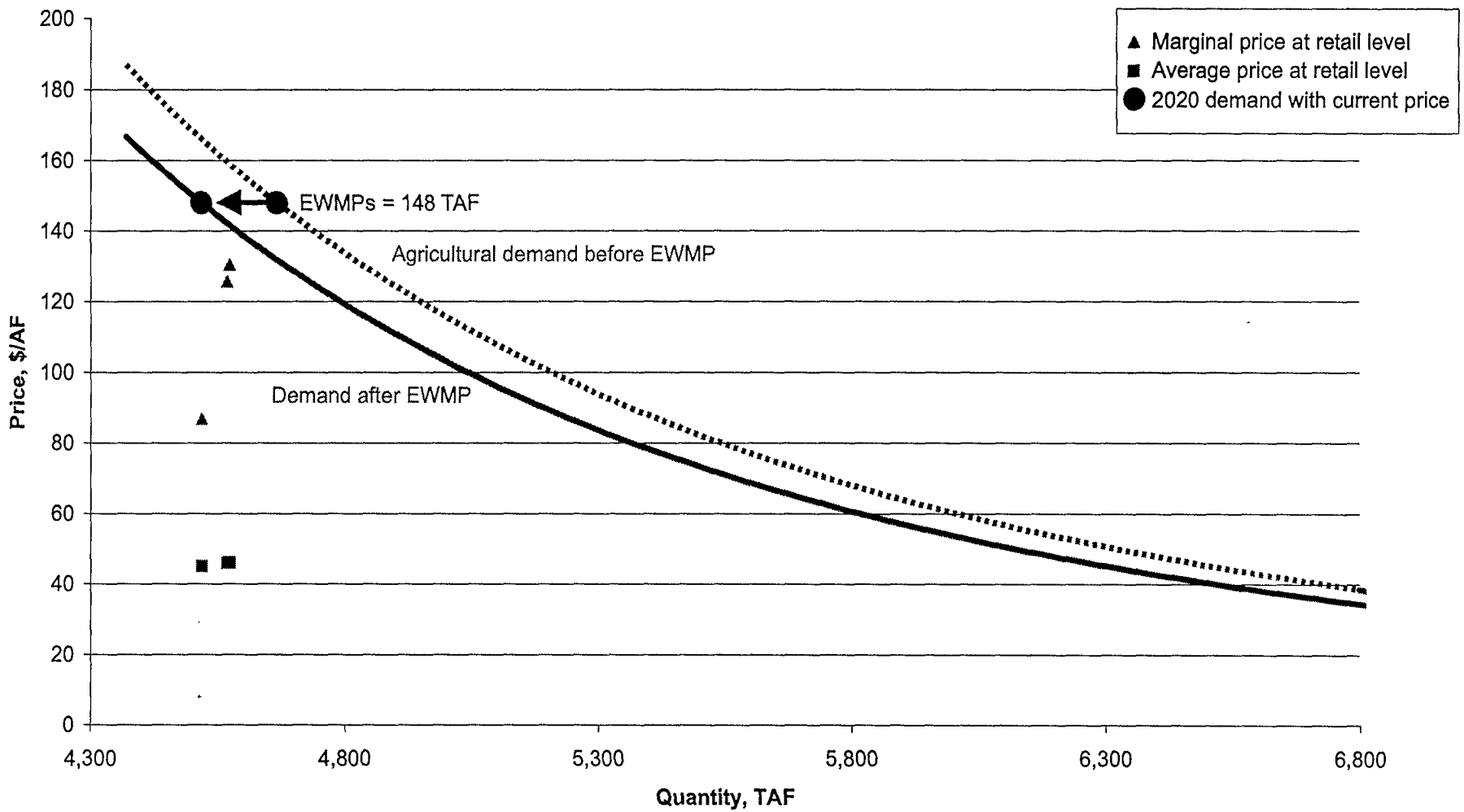

Chart 24
Screening Level Analysis
Delta Agriculture Preference Set
San Joaquin River Region

D-013572

D-013572

Table 24

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, DELTA AGRICULTURE PREFERENCE SET
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	South Delta Improvements	65	$110	1.15	1	0.678	$30	$0	50.7	$126	4,570	$126	$45.90
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.106	$0	$0	4.9	$130	4,574	$130	$45.99

D-013573

D-013573

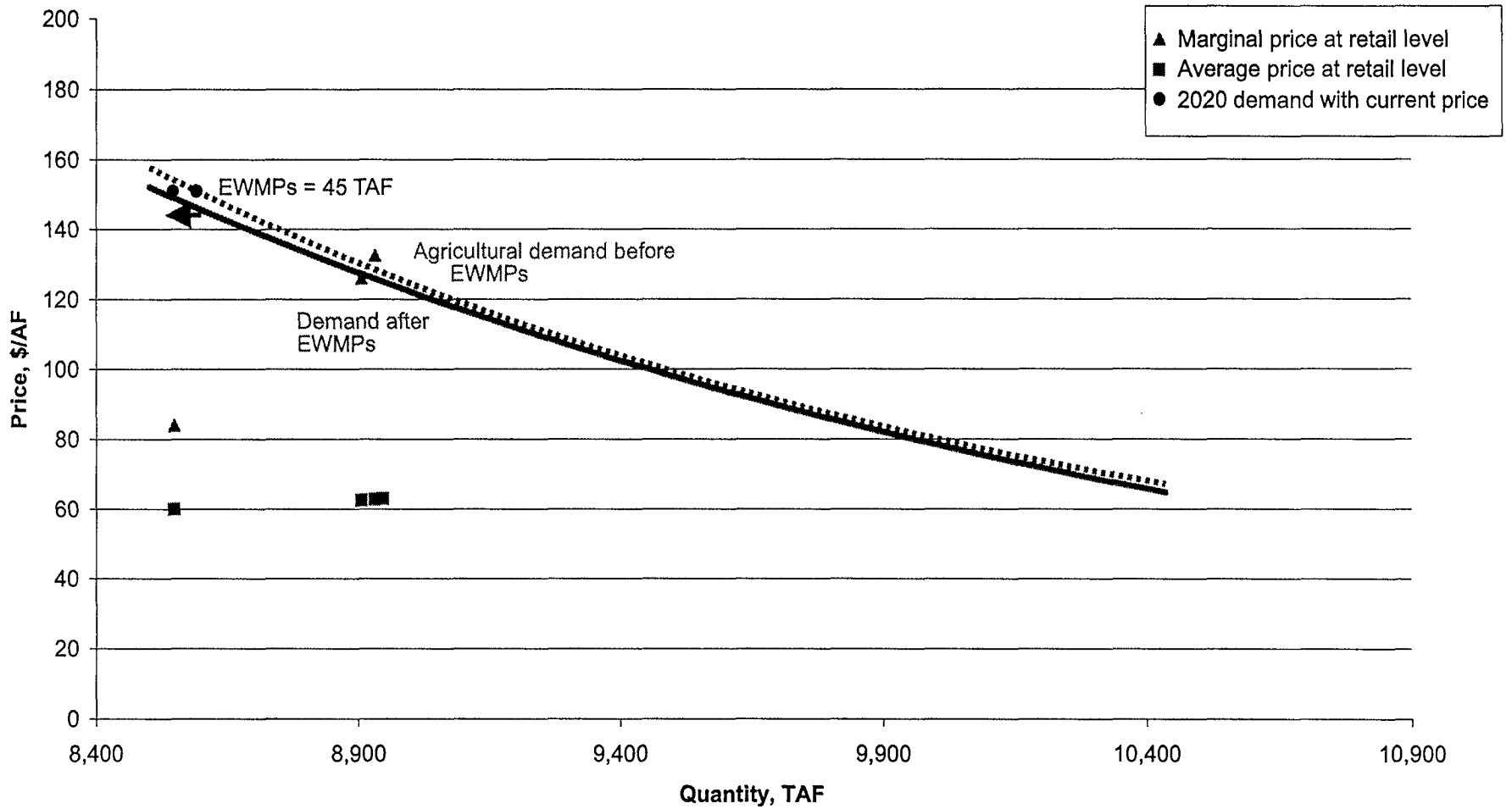

Chart 25
Screening Level Analysis
Delta Agriculture Preference Set
Tulare Lake Region

D-013574

D-013574

Table 25

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, DELTA AGRICULTURE PREFERENCE SET
TULARE LAKE REGION

Type	Location	Option Measure	At Source (dry condition) Q_S Quantity (TAF/year)	At Source (dry condition) C_S Unit Cost ($/AF)	F_R Reapplication Factor	F_S Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Destination: At Farm Dry Q (TAF/year)	At Destination: At Farm Dry P ($/AF)	At Destination: At Farm Cumulative Quantity (TAF/year)	At Destination: Retail Price Using: P_D Marginal Cost at Retail	At Destination: Retail Price Using: P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60 01
Active Conj Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,907	$126	$62 65
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,932	$132	$62 85
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0.322	$60	$25	15.3	$211	8,947	$211	$63 10

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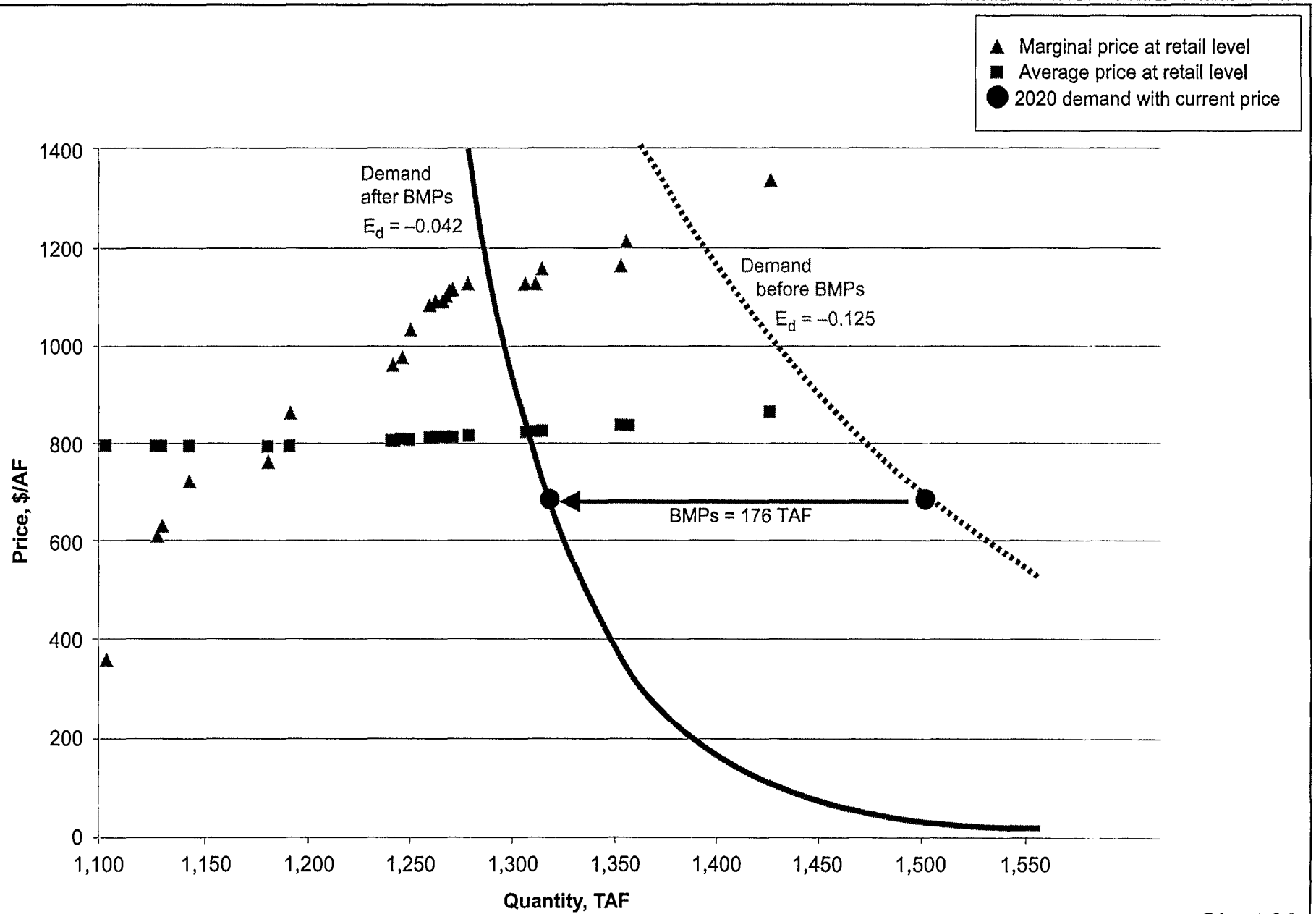

Chart 26
Screening Level Analysis
Sacramento Valley Agriculture Preference Set
San Francisco Bay Region

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Table 26
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, SACRAMENTO VALLEY AGRICULTURE PREFERENCE SET
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_s Quantity (TAF/year)	At Source (dry condition) C_s Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_c Transport Cost	C_T Transaction Fee, $/AF	C_B Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$279	$482	$520	25.0	1103.0	$362	$799
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$276	$482	$520	25.0	1,128.0	$612	$796
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$275	$482	$520	2.0	1,130.0	$632	$795
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$275	$482	$520	13.0	1,143.0	$722	$795
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$275	$482	$520	38.0	1,181.0	$762	$795
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$276	$482	$520	11.0	1,192.0	$882	$796
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$284	$482	$520	50.0	1,242.0	$962	$804
Other	Delta	South Delta Improvements	65	$110	1	1	10%	0.082	$90	$0	$248	$0	$0	$493	$285	$482	$520	4.8	1,246.8	$975	$805
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1	1	10%	0.082	$90	$0	$248	$0	$0	$550	$286	$482	$520	3.7	1,250.5	$1,032	$806
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$288	$482	$520	10.0	1,260.5	$1,082	$808
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	10%	0.082	$90	$25	$248	$0	$0	$606	$289	$482	$520	2.4	1,262.8	$1,088	$809
Active Conj. Use	Sacramento	Project 1	50	$150	1	0.8	10%	0.082	$90	$25	$248	$0	$0	$606	$290	$482	$520	3.0	1,265.8	$1,088	$810
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	10%	0.082	$90	$25	$248	$0	$0	$619	$291	$482	$520	3.0	1,268.8	$1,101	$811
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	10%	0.082	$90	$0	$248	$0	$0	$627	$291	$482	$520	0.7	1,269.4	$1,109	$811
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$291	$482	$520	2.0	1,271.4	$1,112	$811
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.082	$60	$25	$248	$0	$0	$641	$293	$482	$520	7.4	1,278.8	$1,123	$813
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.071	$90	$0	$248	$0	$0	$642	$301	$482	$520	28.8	1,307.6	$1,124	$821
Additional options to the right of the demand function (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.011	$90	$0	$248	$0	$0	$642	$302	$482	$520	4.5	1,312.0	$1,124	$822
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	10%	0.082	$90	$25	$248	$0	$0	$674	$303	$482	$520	3.0	1,315.0	$1,156	$823
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$314	$482	$520	39.0	1,354.0	$1,162	$834
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	10%	0.082	$90	$25	$248	$0	$0	$729	$315	$482	$520	3.0	1,356.9	$1,211	$835
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$341	$482	$520	70.0	1,426.9	$1,332	$861
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$371	$482	$520	85.0	1,511.9	$1,362	$891
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$374	$482	$520	7.0	1,518.9	$1,487	$894
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1	1	10%	0.082	$90	$0	$248	$0	$0	$1,335	$388	$482	$520	22.9	1,541.8	$1,817	$908
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develop.	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$424	$482	$520	50.0	1,591.8	$2,012	$944
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$449	$482	$520	28.0	1,619.8	$2,362	$969

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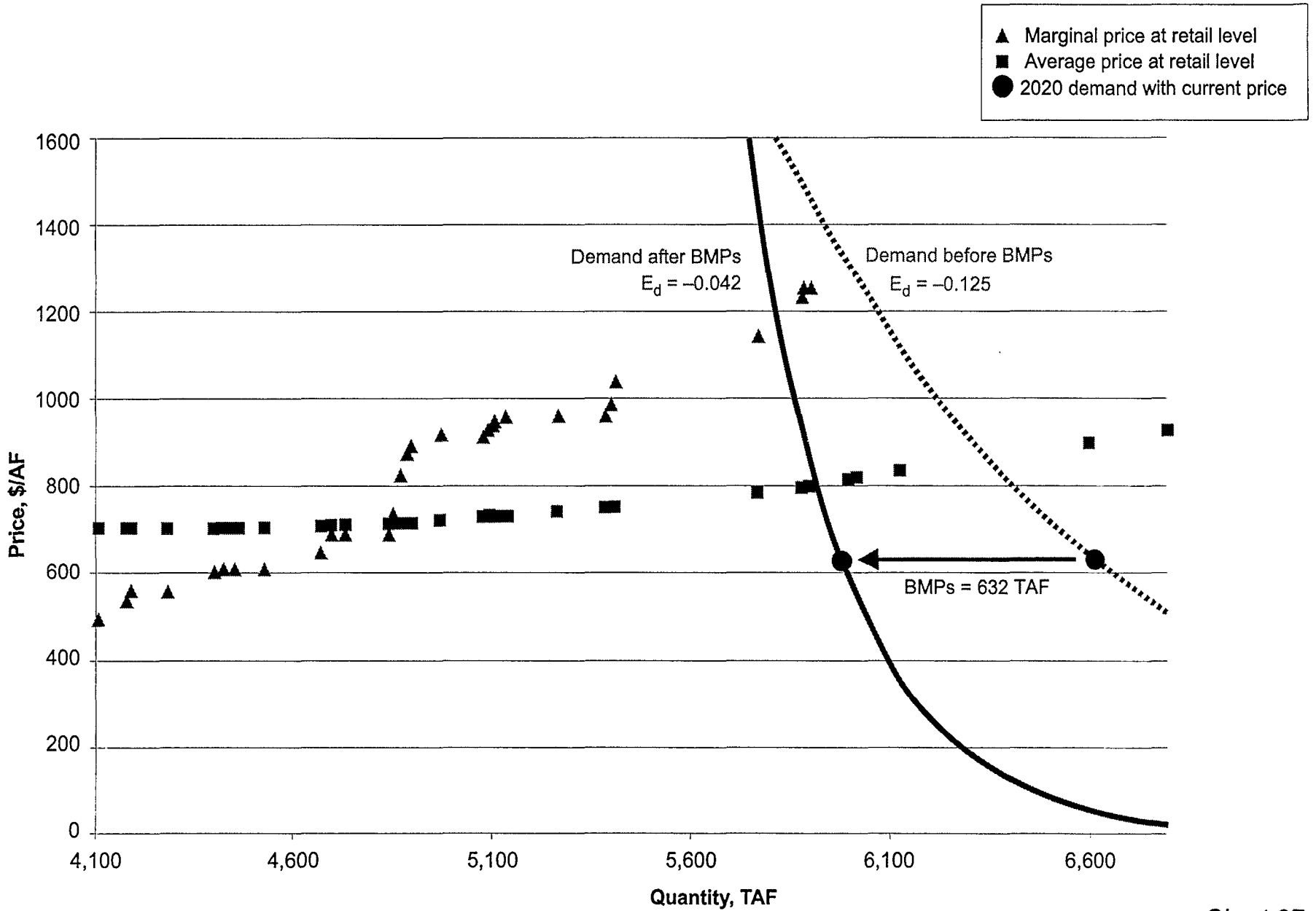

Chart 27
Screening Level Analysis
Sacramento Valley Agriculture Preference Set
South Coast Region

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Table 27

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, SACRAMENTO VALLEY AGRICULTURE PREFERENCE SET
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination, Retail Price Using: P_D Marginal Cost at Retail	At Destination, Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$202	$325	$500	24.0	4111.0	$486	$702
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$202	$325	$500	70.9	4,181.8	$531	$702
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$202	$325	$500	7.6	4,189.5	$554	$702
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$202	$325	$500	91.6	4,281.0	$554	$702
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$204	$325	$500	119.9	4,400.9	$600	$704
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$205	$325	$500	20.7	4,421.6	$605	$705
Other	Color. River	Coachella Canal lining	28	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$205	$325	$500	28.3	4,450.0	$605	$705
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$207	$325	$500	74.1	4,524.1	$605	$707
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$210	$325	$500	141.7	4,665.8	$646	$710
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$211	$325	$500	29.4	4,695.2	$692	$711
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$212	$325	$500	32.7	4,727.9	$692	$712
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$216	$325	$500	109.0	4,836.9	$692	$716
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$216	$325	$500	10.9	4,847.8	$738	$716
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.3	$140	$0	$248	$0	$0	$503	$217	$325	$500	19.1	4,866.9	$828	$717
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.09	1	10%	0.3	$140	$0	$248	$0	$0	$555	$218	$325	$500	14.7	4,881.7	$880	$718
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.3	$140	$25	$248	$0	$0	$568	$219	$325	$500	11.8	4,893.4	$893	$719
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$225	$325	$500	73.0	4,966.5	$921	$725
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$233	$325	$500	109.0	5,075.5	$921	$733
Active Conj. Use	Sacramento	Project 1	50	$150	1.09	0.8	10%	0.3	$140	$25	$248	$0	$0	$606	$233	$325	$500	11.8	5,087.2	$931	$733
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	10%	0.3	$140	$25	$248	$0	$0	$619	$234	$325	$500	11.8	5,099.0	$944	$734
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.09	1	10%	0.3	$140	$0	$248	$0	$0	$626	$234	$325	$500	2.6	5,101.7	$951	$734
Active Conj. Use	Tulare	Project 1	100	$260	1.09	1	10%	0.3	$110	$25	$248	$0	$0	$639	$237	$325	$500	29.4	5,131.1	$964	$737
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1.09	1	10%	0.3	$140	$0	$248	$0	$0	$640	$247	$325	$500	132.4	5,263.5	$965	$747
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$256	$325	$500	119.9	5,383.4	$967	$756
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.327	$140	$25	$248	$0	$0	$669	$257	$325	$500	12.8	5,396.3	$994	$757
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.327	$140	$25	$248	$0	$0	$720	$258	$325	$500	12.8	5,409.1	$1,045	$758
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$293	$325	$500	359.7	5,768.8	$1,151	$793
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$305	$325	$500	109.0	5,877.8	$1,242	$805
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$307	$325	$500	20.7	5,898.5	$1,265	$807
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$878	1.09	1	10%	0.051	$140	$0	$248	$0	$0	$1,276	$310	$325	$500	15.5	5,914.0	$1,601	$810
Additional options to the right of the demand function (after BMPs)																					
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$878	1.09	1	10%	0.276	$140	$0	$248	$0	$0	$1,276	$323	$325	$500	83.9	5,997.9	$1,601	$823
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$326	$325	$500	20.7	6,018.7	$1,609	$826
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$343	$325	$500	109.0	6,127.7	$1,609	$843
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$411	$325	$500	474.2	6,601.8	$1,609	$911
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,650	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$440	$325	$500	195.1	6,796.9	$1,747	$940
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$457	$325	$500	88.3	6,885.2	$2,068	$957

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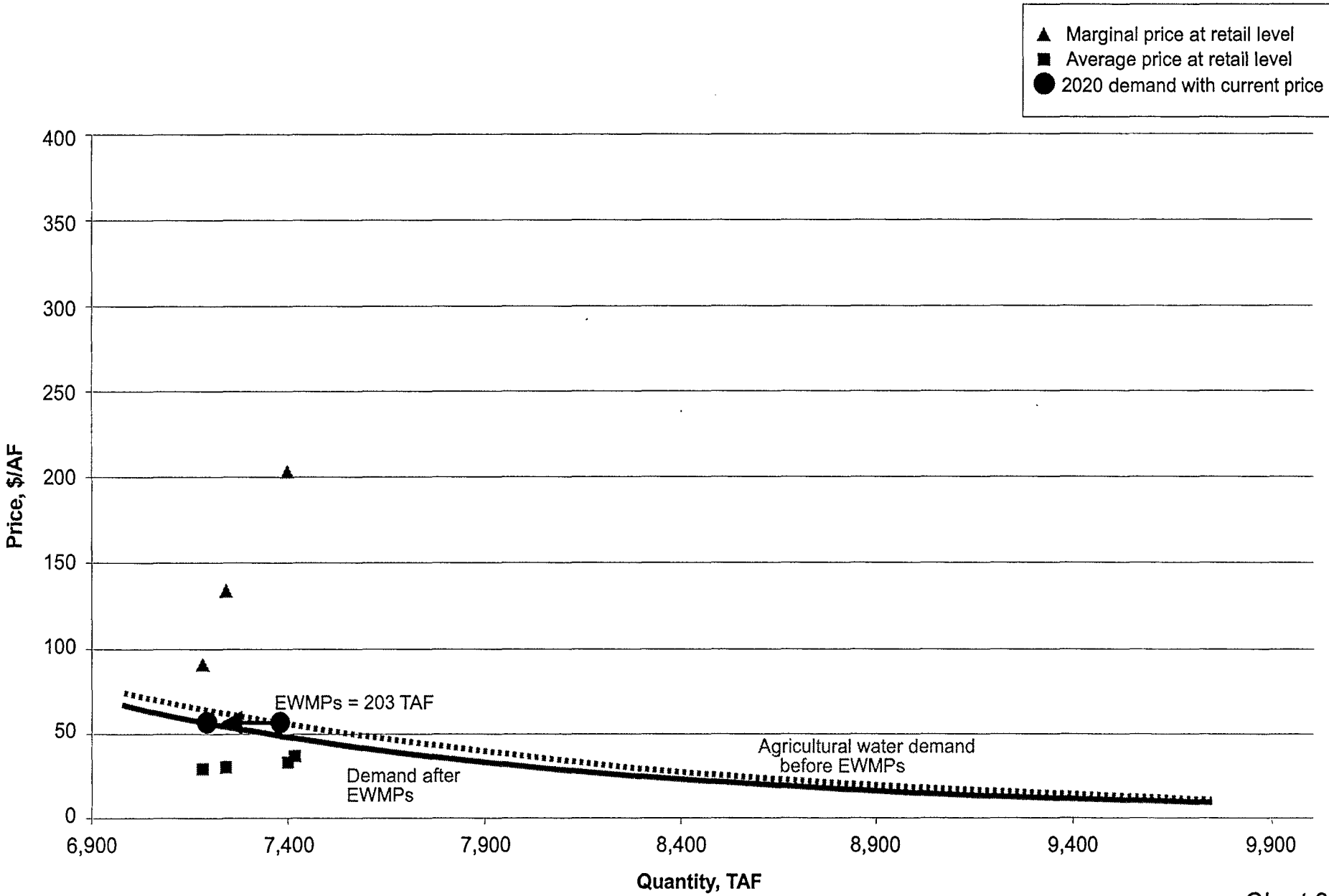

Chart 28

Screening Level Analysis
Sacramento Valley Agriculture Preference Set
Sacramento River Region

D-013580

Table 28

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, SACRAMENTO VALLEY AGRICULTURE PREFERENCE SET
SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination				
										At Farm			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											
Options screened to meet demand														
Other	Delta	South Delta Improvements	65	$110	1.21	1	0	$0	$0	0.0	$91	7,182	$91	$30.00
Active Conj. Use	San Joaquin	Project 1	40	$150	1.21	1	0	$0	$0	0.0	$124	7,182	$124	$30.00
Active Conj. Use	Sacramento	Project 1	50	$150	1.21	1	0.491	$0	$0	29.7	$124	7,212	$124	$30.39
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.21	1	0.491	$0	$0	29.7	$134	7,241	$134	$30.81
Active Conj. Use	San Joaquin	Project 2	40	$200	1.21	1	0	$0	$0	0.0	$165	7,241	$165	$30.81
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.21	1	0	$0	$0	0.0	$192	7,241	$192	$30.81
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.21	1	0.289	$0	$0	157.4	$203	7,399	$203	$34.48
Active Conj. Use	San Joaquin	Project 3	40	$250	1.21	1	0	$0	$0	0.0	$207	7,399	$207	$34.48
Active Conj. Use	Tulare	Project 1	100	$250	1.21	1	0	$0	$0	0.0	$207	7,399	$207	$34.48
Active Conj. Use	San Joaquin	Project 4	40	$300	1.21	1	0	$0	$0	0.0	$248	7,399	$248	$34.48
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.21	1	0	$0	$0	0.0	$724	7,399	$724	$34.48
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.21	1	1	$0	$0	18.2	$1,240	7,417	$1,240	$37.43

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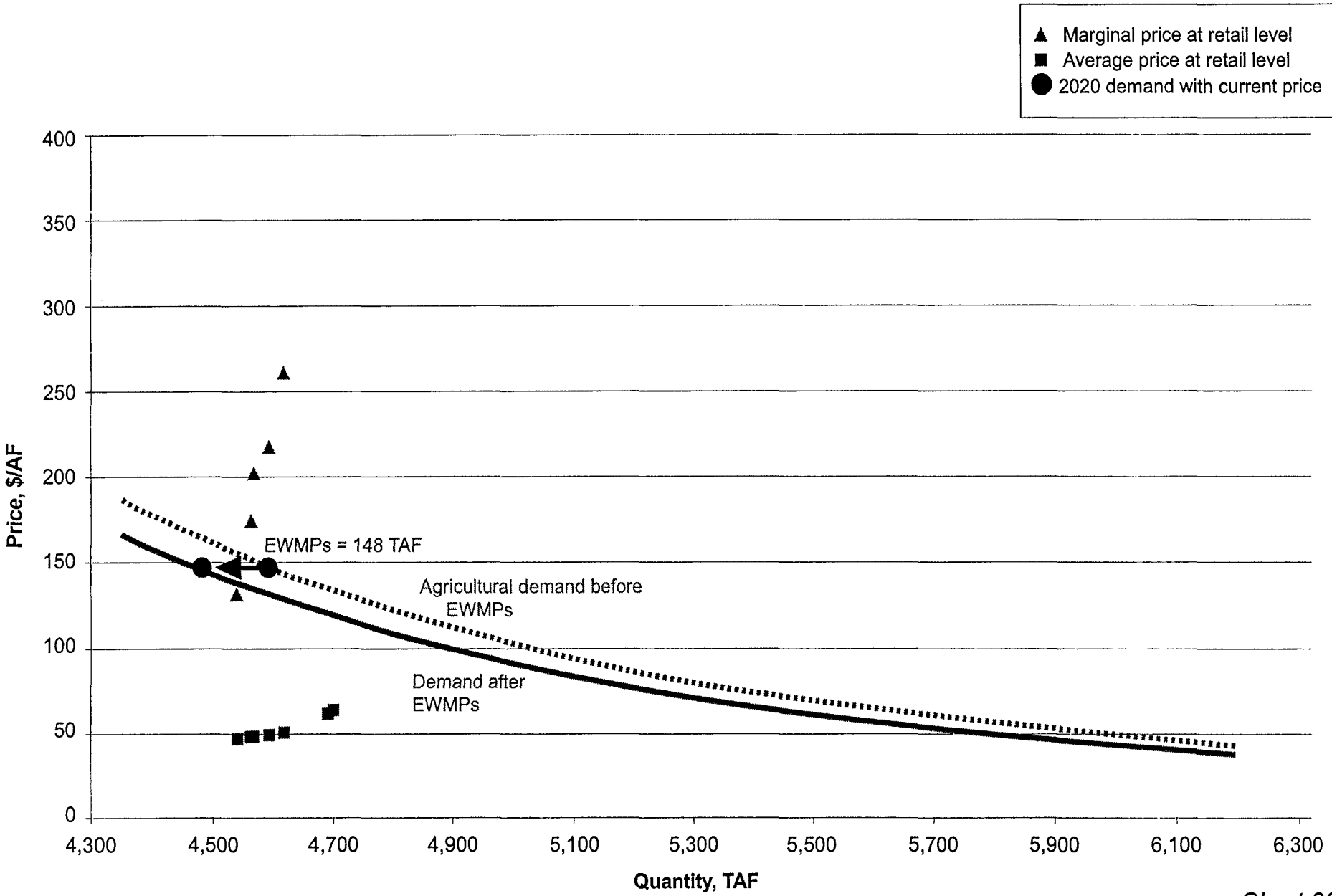

Chart 29

Screening Level Analysis
Sacramento Valley Agriculture Preference Set
San Joaquin River Region

Table 29
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, SACRAMENTO VALLEY AGRICULTURE PREFERENCE SET
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Desination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Other	Delta	South Delta Improvements	65	$110	1.15	1	0	$30	$0	0.0	$126	4,518	$126	$45.00
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.491	$0	$0	22.6	$130	4,541	$130	$45.42
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.15	1	0	$30	$0	0.0	$171	4,541	$171	$45.42
Active Conj. Use	San Joaquin	Project 2	40	$200	1.15	1	0.491	$0	$0	22.6	$174	4,563	$174	$46.06
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.15	1	0.491	$0	$0	5.1	$202	4,568	$202	$46.23
Active Conj. Use	San Joaquin	Project 3	40	$250	1.15	1	0.546	$0	$0	25.1	$217	4,593	$217	$47.17
Active Conj. Use	Tulare	Project 1	100	$250	1.15	1	0	$0	$0	0.0	$217	4,593	$217	$47.17
Active Conj. Use	Sacramento	Project 1	50	$150	1.15	0.8	0	$30	$25	0.0	$218	4,593	$218	$47.17
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.15	1	0	$30	$0	0.0	$244	4,593	$244	$47.17
Active Conj. Use	San Joaquin	Project 4	40	$300	1.15	1	0.546	$0	$0	25.1	$261	4,618	$261	$48.33
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.15	1	0.208	$0	$0	74.2	$762	4,693	$762	$59.61
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.15	1	1	$0	$0	8.1	$1,304	4,701	$1,304	$61.74

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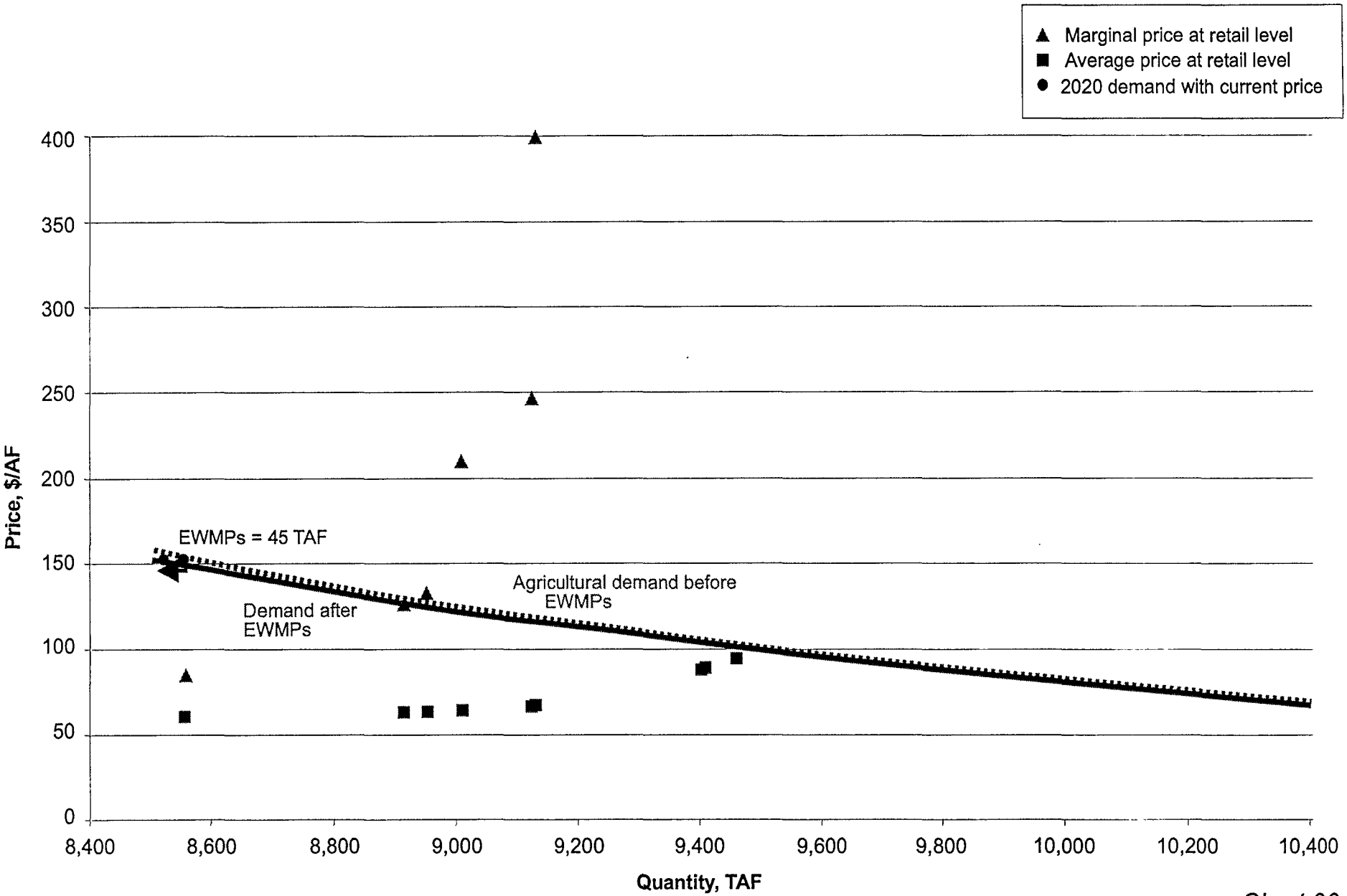

Chart 30

Screening Level Analysis
Sacramento Valley Agriculture Preference Set
Tulare Lake Region

D-013585

Table 30
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, SACRAMENTO VALLEY AGRICULTURE PREFERENCE SET
TULARE LAKE REGION

			At Source (dry condition)							At Destination				
													Retail Price Using:	
		Option	Q_O Quantity	C_O Unit Cost	F_R Reappli-cation	F_D Delta Loss	F_A Share of New Supply	C_C Transport	C_T Transaction	At Farm Dry Q	At Farm Dry P	Cumulative Quantity	P_D Marginal Cost	P_D Average Cost
Type	Location	Measure	(TAF/year)	($/AF)	Factor	Factor	Factor	Cost	Fee, $/AF	(TAF/year)	($/AF)	(TAF/year)	at Retail	at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	1	$0	$0	8.3	$84	8,555	$84	$60.02
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,912	$126	$62.67
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.491	$40	$0	38.0	$132	8,950	$132	$62.96
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.19	1	0	$40	$0	0.0	$176	8,950	$176	$62.96
Active Conj. Use	Tulare	Project 1	100	$250	1.19	1	0.491	$0	$0	58.4	$210	9,009	$210	$63.92
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0	$60	$25	0.0	$211	9,009	$211	$63.92
Active Conj. Use	Sacramento	Project 1	50	$150	1.19	0.8	0	$40	$25	0.0	$223	9,009	$223	$63.92
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.19	1	0.213	$40	$0	114.1	$247	9,123	$247	$66.20
Active Conj. Use	San Joaquin	Project 2	40	$200	1.19	1	0	$60	$25	0.0	$253	9,123	$253	$66.20
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.19	1	0	$60	$0	0.0	$255	9,123	$255	$66.20
Active Conj. Use	San Joaquin	Project 3	40	$250	1.19	1	0	$60	$25	0.0	$295	9,123	$295	$66.20
Active Conj. Use	San Joaquin	Project 4	40	$300	1.19	1	0	$60	$25	0.0	$337	9,123	$337	$66.20
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.19	1	1	$0	$0	6.0	$399	9,129	$399	$66.42
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.19	1	0.741	$60	$0	273.4	$796	9,402	$796	$87.64
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.19	1	1	$0	$0	6.0	$798	9,408	$798	$88.09
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.19	1	1	$0	$0	52.4	$1,261	9,460	$1,261	$94.57

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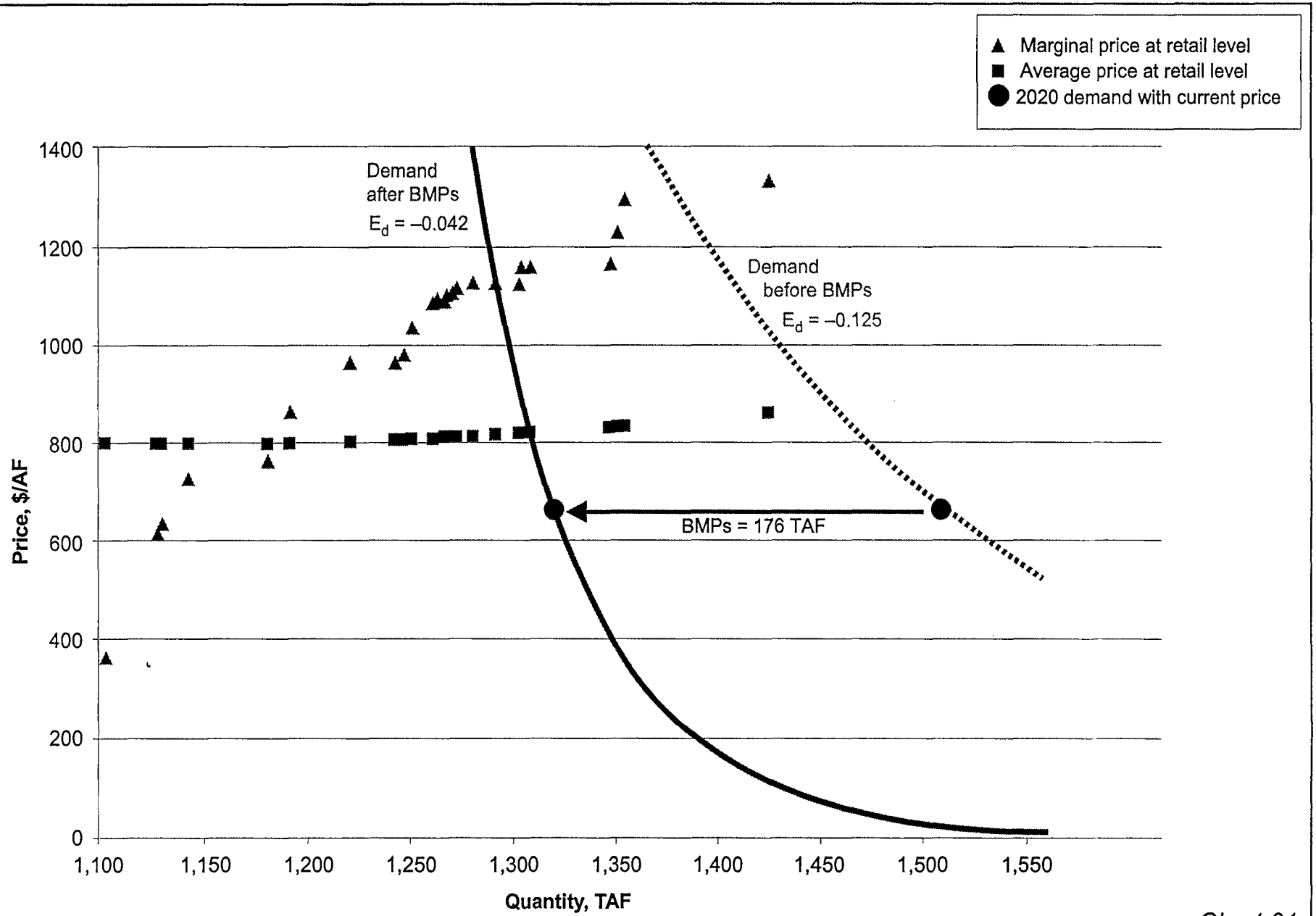

Chart 31

Screening Level Analysis
San Joaquin Valley Agriculture Preference Set
San Francisco Bay Region

Table 31

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, SAN JOAQUIN VALLEY AGRICULTURE PREFERENCE SET
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_S Quantity (TAF/year)	At Source (dry condition) C_S Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive P_M Marginal Unit Cost $/AF	Retail Cost Additive P_M Average Unit Cost $/AF	At Destination Q_D Retail Quantity (TAF/year)	At Destination Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(178)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$279	$482	$520	25.0	1103.0	$362	$799
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$278	$482	$520	25.0	1128.0	$612	$796
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$275	$482	$520	2.0	1130.0	$632	$795
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$80	$0	$240	$275	$482	$520	13.0	1143.0	$722	$795
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$275	$482	$520	38.0	1181.0	$762	$796
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$278	$482	$520	11.0	1192.0	$862	$796
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	0.57	$0	$0	$0	-$120	-$500	$480	$281	$482	$520	28.5	1220.5	$962	$801
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	0.43	$0	$0	$0	-$120	-$500	$480	$284	$482	$520	21.5	1242.0	$962	$804
Other	Delta	South Delta Improvements	65	$110	1	1	10%	0.082	$90	$0	$248	$0	$0	$493	$285	$482	$520	4.8	1246.8	$975	$805
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1	1	10%	0.082	$90	$0	$248	$0	$0	$550	$286	$482	$520	3.7	1250.5	$1,032	$806
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$288	$482	$520	10.0	1260.5	$1,082	$808
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	10%	0.082	$90	$25	$248	$0	$0	$606	$289	$482	$520	2.4	1262.8	$1,088	$809
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	10%	0.082	$90	$25	$248	$0	$0	$606	$290	$482	$520	3.5	1266.4	$1,088	$810
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	10%	0.082	$90	$25	$248	$0	$0	$619	$291	$482	$520	3.0	1269.3	$1,101	$811
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	10%	0.082	$90	$0	$248	$0	$0	$627	$291	$482	$520	0.7	1270.0	$1,109	$811
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$291	$482	$520	2.0	1272.0	$1,112	$811
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.082	$60	$25	$248	$0	$0	$641	$293	$482	$520	7.4	1279.4	$1,123	$813
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.0268	$90	$0	$248	$0	$0	$642	$296	$482	$520	10.9	1290.2	$1,124	$816
Additional options to the right of the demand function (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.0552	$90	$0	$248	$0	$0	$642	$299	$482	$520	22.4	1301.7	$1,124	$819
Active Conj. Use	San Joaquin	Project 3	20	$250	1	1	10%	0.082	$90	$25	$248	$0	$0	$674	$300	$482	$520	1.5	1303.2	$1,156	$820
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	10%	0.082	$90	$25	$248	$0	$0	$674	$301	$482	$520	3.5	1306.8	$1,156	$821
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$312	$482	$520	39.0	1345.8	$1,162	$832
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	10%	0.082	$90	$25	$248	$0	$0	$743	$313	$482	$520	3.5	1349.3	$1,225	$833
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	10%	0.082	$90	$25	$248	$0	$0	$812	$314	$482	$520	3.5	1352.8	$1,294	$834
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$341	$482	$520	70.0	1422.8	$1,332	$861
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$371	$482	$520	85.0	1507.8	$1,362	$891
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$374	$482	$520	7.0	1514.8	$1,487	$894
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1	1	10%	0.082	$90	$0	$248	$0	$0	$1,335	$388	$482	$520	22.9	1537.7	$1,817	$908
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develop	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$424	$482	$520	50.0	1587.7	$2,012	$944
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$449	$482	$520	28.0	1615.7	$2,362	$969

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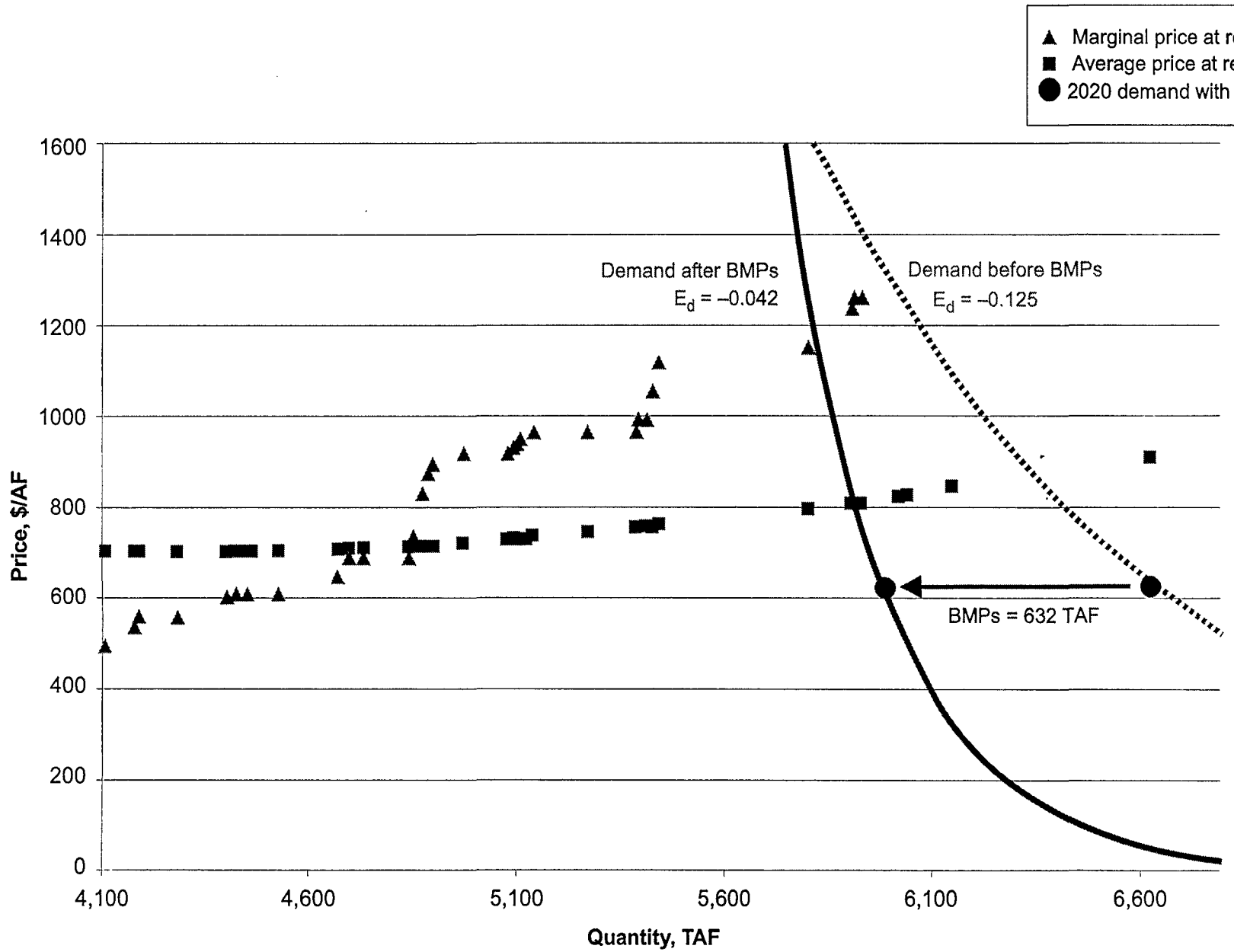

Chart 32

Screening Level Analysis
San Joaquin Valley Agriculture Preference Set
South Coast Region

Table 32
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, SAN JOAQUIN VALLEY AGRICULTURE PREFERENCE SET
SOUTH COAST REGION

Option			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Measure	Q_S Quantity (TAF/year)	C_S Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_S Transport Cost	C_T Transaction Fee, $/AF	C_S Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$60	$25	$0	$0	$0	$161	$202	$325	$500	24.0	4111.0	$486	$702
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$60	$25	$0	$0	$0	$204	$202	$325	$500	70.9	4181.8	$621	$702
Other	South Coast	Agriculture WUE Range 1	7	$260	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$202	$325	$500	7.6	4188.5	$654	$702
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$60	$0	$229	$202	$325	$500	91.6	4261.0	$654	$702
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$204	$325	$500	119.9	4400.9	$600	$704
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$60	$25	$0	$0	$0	$240	$206	$325	$500	20.7	4421.6	$605	$705
Other	Color. River	Coachella Canal lining	34	$230	1.09	1	0%	1	$60	$25	$0	$0	$0	$260	$206	$325	$500	28.2	4450.0	$605	$705
Other	Color. River	All American Canal lining	64	$230	1.09	1	0%	1	$60	$25	$0	$0	$0	$290	$207	$325	$500	74.1	4524.1	$605	$707
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$210	$325	$500	141.7	4665.8	$646	$710
Other	South Coast	Desalination Range 1	27	$600	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$211	$325	$500	29.4	4695.2	$662	$711
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$600	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$212	$325	$500	32.7	4727.9	$662	$712
Urban Recycling	South Coast	Range 1	100	$600	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$216	$325	$500	109.0	4836.9	$662	$716
Other	South Coast	Agriculture WUE Range 2	10	$460	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$216	$325	$500	10.9	4847.8	$738	$716
Other	Delta	South Delta improvements	65	$110	1.09	1	10%	0.3	$140	$0	$248	$0	$0	$603	$217	$325	$500	19.1	4866.9	$828	$717
Surface Storage	Sacramento	Sac. River Overtream High Yield Est.	50	$162	1.09	1	10%	0.3	$140	$0	$248	$0	$0	$658	$218	$325	$500	14.7	4881.7	$880	$718
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.3	$140	$25	$248	$0	$0	$648	$219	$325	$500	11.8	4893.4	$883	$719
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$225	$325	$500	73.0	4966.5	$921	$725
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$233	$325	$500	109.0	5075.5	$921	$733
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	10%	0.3	$140	$25	$248	$0	$0	$606	$234	$325	$500	14.1	5089.6	$931	$734
Active Conj. Use	San Joaquin	Project 2	40	$300	1.09	1	10%	0.3	$140	$25	$248	$0	$0	$618	$234	$325	$500	11.8	$101.4	$944	$734
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$222	1.09	1	10%	0.3	$140	$0	$248	$0	$0	$626	$236	$325	$500	2.6	$104.0	$961	$736
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	10%	0.3	$110	$25	$248	$0	$0	$639	$237	$325	$500	29.4	$133.4	$964	$737
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.09	1	10%	0.3	$140	$0	$248	$0	$0	$640	$247	$325	$500	132.4	$265.8	$965	$747
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$254	$325	$500	119.9	$385.8	$967	$754
Active Conj. Use	San Joaquin	Project 3	20	$350	1.09	1	10%	0.227	$140	$25	$248	$0	$0	$649	$256	$325	$500	6.4	$392.2	$984	$756
Active Conj. Use	Sacramento	Project 2	60	$300	1.09	0.8	10%	0.227	$140	$25	$248	$0	$0	$646	$258	$325	$500	15.4	$407.6	$984	$758
Active Conj. Use	Sacramento	Project 3	60	$350	1.09	0.8	10%	0.227	$140	$25	$248	$0	$0	$732	$259	$325	$500	15.4	$423.0	$1,067	$758
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	10%	0.227	$140	$25	$248	$0	$0	$796	$260	$325	$500	15.4	$438.4	$1,120	$760
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$295	$325	$500	359.7	$798.1	$1,151	$785
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$307	$325	$500	109.0	$907.1	$1,242	$807
Urban WUE	South Coast	Reduce indoor CII use from 2% to 5%	18	$1,125	1.09	1	0%	0.375	$0	$0	$0	-$100	$0	$940	$308	$325	$500	7.9	$914.9	$1,266	$808
Additional options to the right of the demand function (after BMPs)																					
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	18	$1,125	1.09	1	0%	0.625	$0	$0	$0	-$100	$0	$940	$309	$325	$500	12.9	$927.8	$1,266	$809
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.09	1	10%	0.3	$140	$0	$248	$0	$0	$1,276	$324	$325	$500	91.2	$1019.0	$1,601	$824
Other	South Coast	Agriculture WUE Range 3	18	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$327	$325	$500	20.7	$1039.7	$1,608	$827
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$344	$325	$500	109.0	$1148.7	$1,608	$844
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$411	$325	$500	474.2	$1622.9	$1,608	$911
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,650	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$440	$325	$500	195.1	$1818.0	$1,747	$940
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$467	$325	$500	88.3	$1906.3	$2,066	$967

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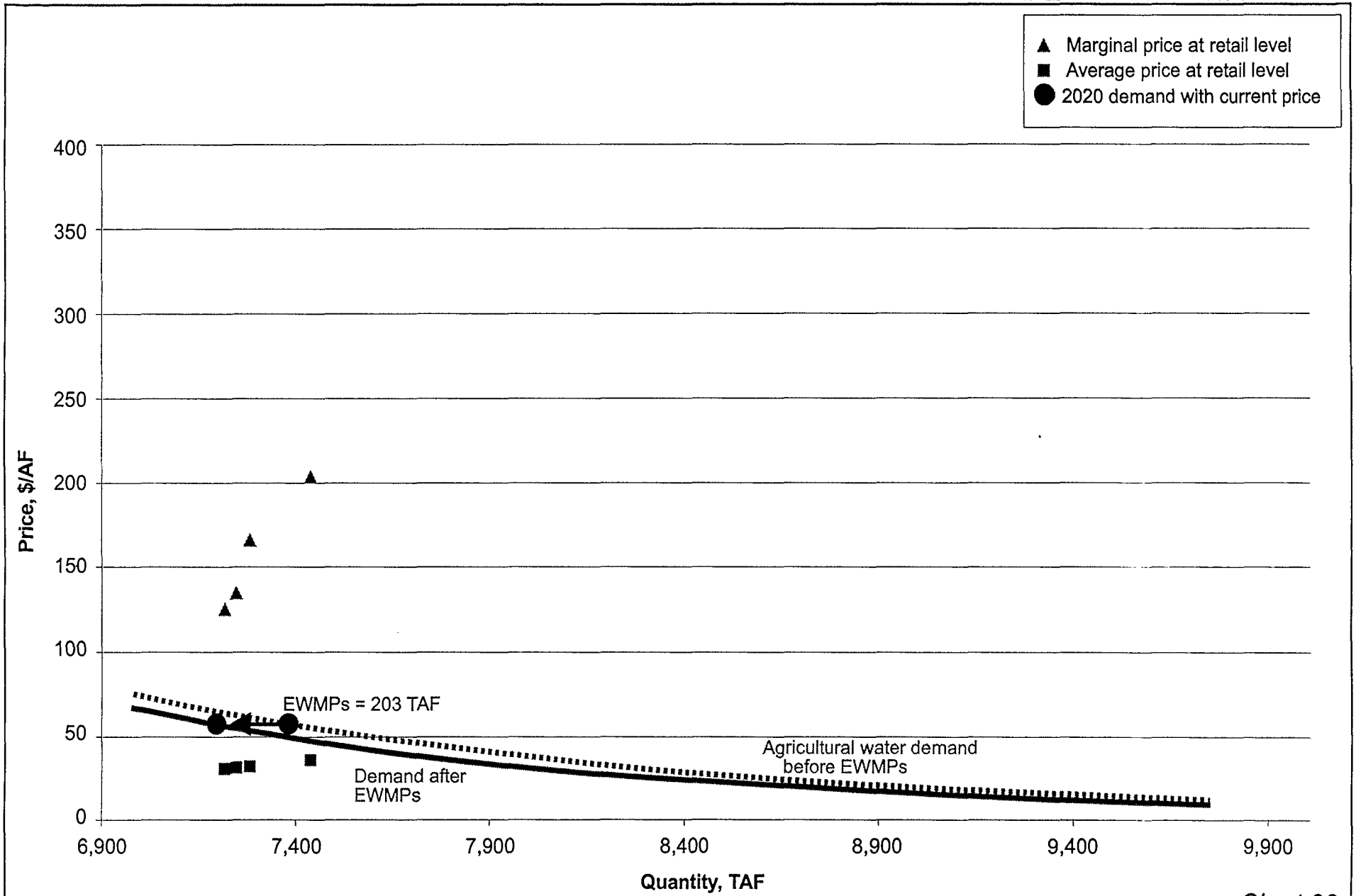

Chart 33

Screening Level Analysis
San Joaquin Valley Agriculture Preference Set
Sacramento River Region

D-013590

D-013590

Table 33
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, SAN JOAQUIN VALLEY AGRICULTURE PREFERENCE SET
SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											
Options screened to meet demand														
Other	Delta	South Delta Improvements	65	$110	1.21	1	0	$0	$0	0.0	$91	7,182	$91	$30.00
Active Conj. Use	San Joaquin	Project 1	40	$150	1.21	1	0	$0	$0	0.0	$124	7,182	$124	$30.00
Active Conj. Use	Sacramento	Project 1	60	$150	1.21	1	0.491	$0	$0	35.6	$124	7,218	$124	$30.46
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.21	1	0.491	$0	$0	29.7	$134	7,247	$134	$30.89
Active Conj. Use	San Joaquin	Project 2	40	$200	1.21	1	0	$0	$0	0.0	$165	7,247	$165	$30.89
Active Conj. Use	Sacramento	Project 2	60	$200	1.21	1	0.491	$0	$0	35.6	$165	7,283	$165	$31.55
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.21	1	0	$0	$0	0.0	$192	7,283	$192	$31.55
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.21	1	0.283	$0	$0	154.1	$203	7,437	$203	$35.10
Active Conj. Use	San Joaquin	Project 3	20	$250	1.21	1	0	$0	$0	0.0	$207	7,437	$207	$35.10
Active Conj. Use	Sacramento	Project 3	60	$250	1.21	1	0	$0	$0	0.0	$207	7,437	$207	$35.10
Active Conj. Use	Tulare	Project 1	100	$250	1.21	1	0	$0	$0	0.0	$207	7,437	$207	$35.10
Active Conj. Use	Sacramento	Project 4	60	$300	1.21	1	0	$0	$0	0.0	$248	7,437	$248	$35.10
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.21	1	0	$0	$0	0.0	$724	7,437	$724	$35.10
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.21	1	0	$0	$0	0.0	$1,240	7,437	$1,240	$35.10

D-013591

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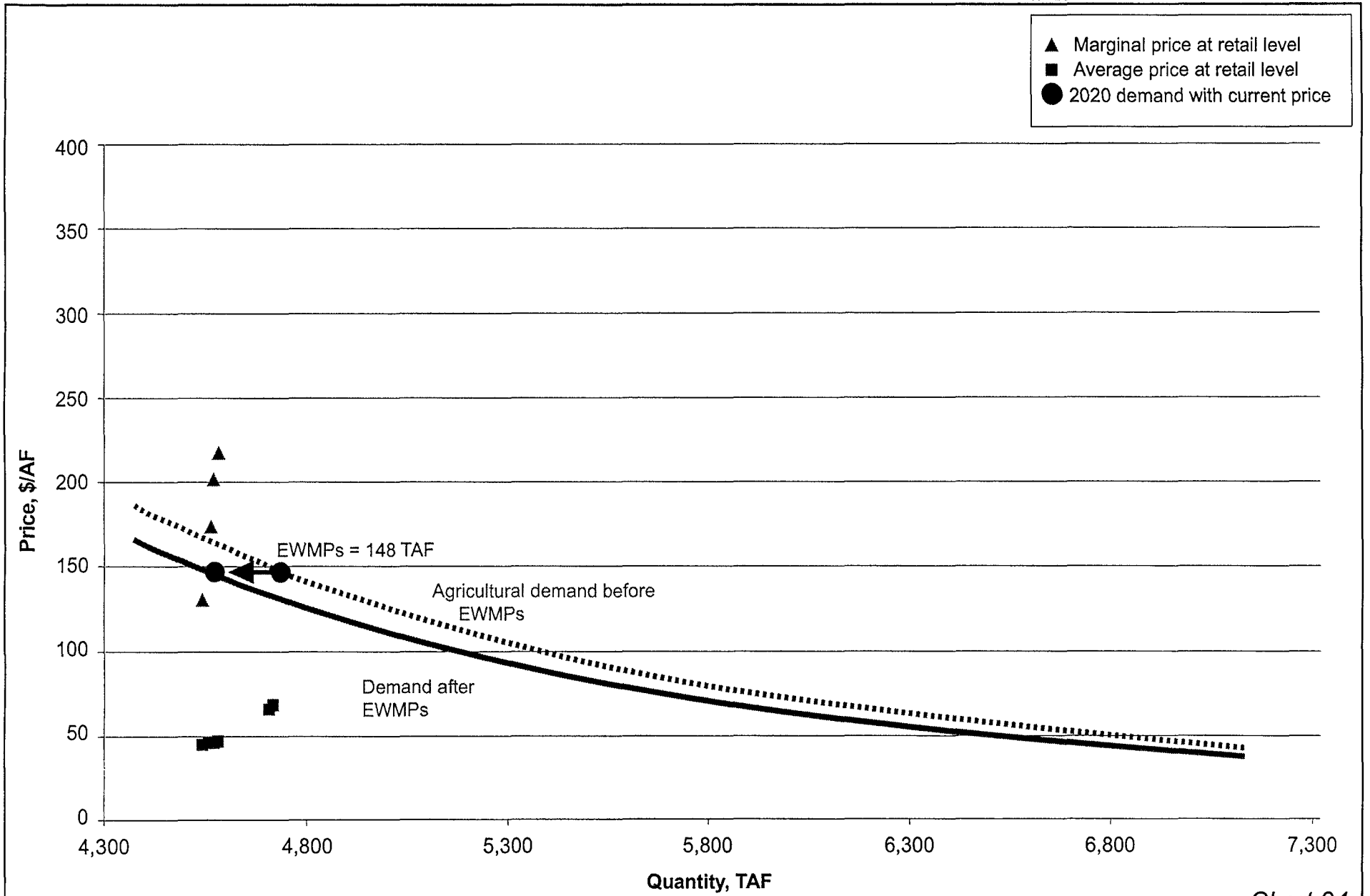

Chart 34

Screening Level Analysis
San Joaquin Valley Agriculture Preference Set
San Joaquin River Region

D-013593

Table 34
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, SAN JOAQUIN VALLEY AGRICULTURE PREFERENCE SET
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Other	Delta	South Delta Improvements	65	$110	1.15	1	0	$30	$0	0.0	$126	4,518	$126	45.00
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.491	$0	$0	22.6	$130	4,541	$130	45.42
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.15	1	0	$30	$0	0.0	$171	4,541	$171	45.42
Active Conj. Use	San Joaquin	Project 2	40	$200	1.15	1	0.491	$0	$0	22.6	$174	4,563	$174	46.06
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.15	1	0.491	$0	$0	5.1	$202	4,568	$202	46.23
Active Conj. Use	San Joaquin	Project 3	20	$250	1.15	1	0.491	$0	$0	11.3	$217	4,580	$217	46.66
Active Conj. Use	Tulare	Project 1	100	$250	1.15	1	0	$0	$0	0.0	$217	4,580	$217	46.66
Active Conj. Use	Sacramento	Project 1	60	$150	1.15	0.8	0	$30	$25	0.0	$218	4,580	$218	46.66
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1.15	1	0	$30	$0	0.0	$244	4,580	$244	46.66
Active Conj. Use	Sacramento	Project 2	60	$200	1.15	0.8	0	$30	$25	0.0	$272	4,580	$272	46.66
Active Conj. Use	Sacramento	Project 3	60	$250	1.15	0.8	0	$30	$25	0.0	$327	4,580	$327	46.66
Active Conj. Use	Sacramento	Project 4	60	$300	1.15	0.8	0	$30	$25	0.0	$381	4,580	$381	46.66
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.15	1	0.361	$0	$0	128.7	$762	4,708	$762	66.20
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.15	1	1	$0	$0	8.1	$1,304	4,716	$1,304	68.32

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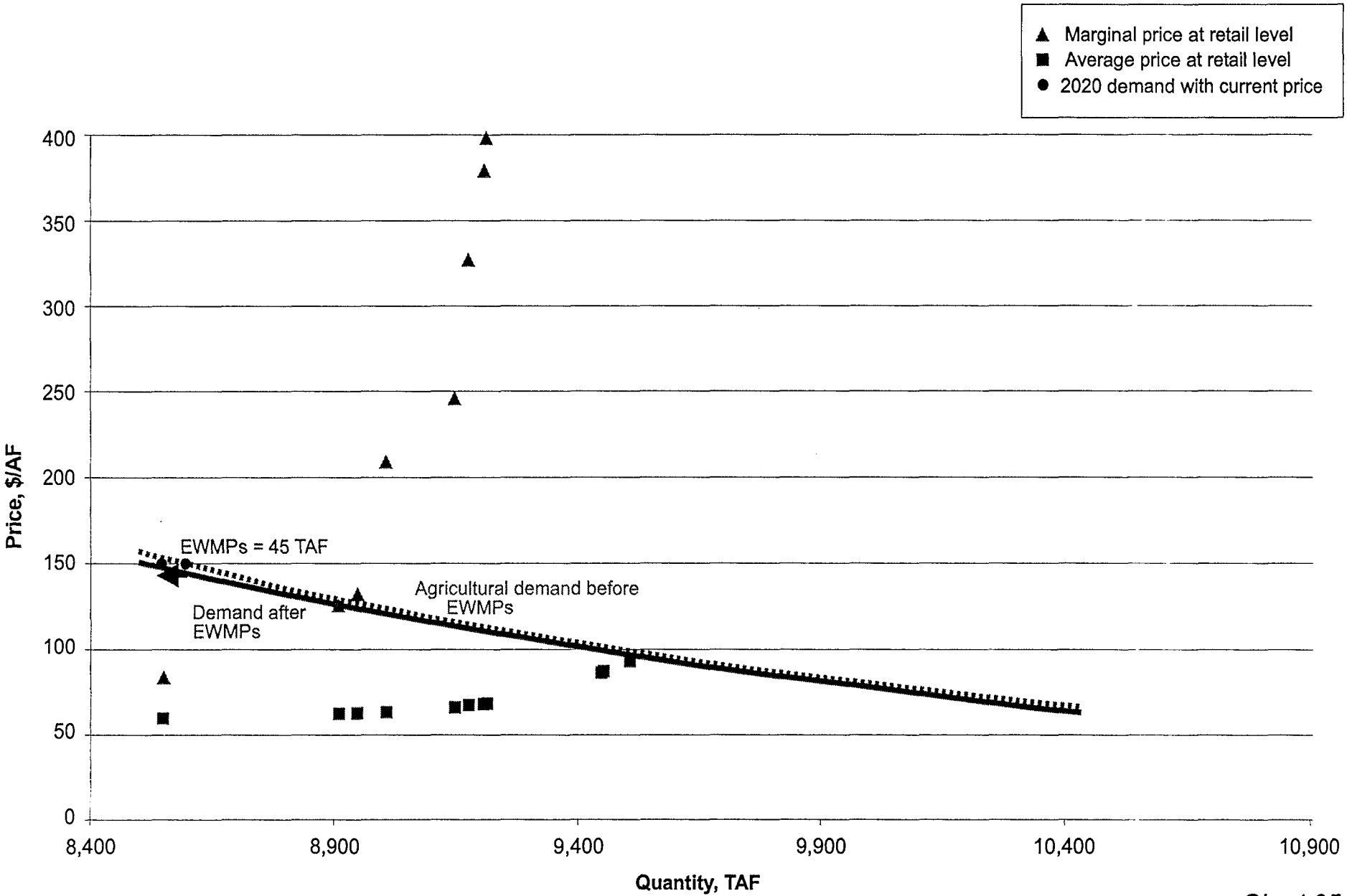

Chart 35

Screening Level Analysis
San Joaquin Valley Agriculture Preference Set
Tulare Lake Region

Table 35
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, SAN JOAQUIN VALLEY AGRICULTURE PREFERENCE SET
TULARE LAKE REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Destination: At Farm Dry Q (TAF/year)	At Destination: At Farm Dry P ($/AF)	At Destination: Cumulative Quantity (TAF/year)	At Destination: Retail Price Using: P_D Marginal Cost at Retail	At Destination: Retail Price Using: P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	1	$0	$0	8.3	$84	8,555	$84	60.02
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,912	$126	62.67
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.491	$40	$0	38.0	$132	8,950	$132	62.96
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.19	1	0	$40	$0	0.0	$176	8,950	$176	62.96
Active Conj. Use	Tulare	Project 1	100	$250	1.19	1	0.491	$0	$0	58.4	$210	9,009	$210	63.92
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0	$60	$25	0.0	$211	9,009	$211	63.92
Active Conj. Use	Sacramento	Project 1	60	$150	1.19	0.8	0	$40	$25	0.0	$223	9,009	$223	63.92
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.19	1	0.263	$40	$0	140.9	$247	9,150	$247	66.73
Active Conj. Use	San Joaquin	Project 2	40	$200	1.19	1	0	$60	$25	0.0	$253	9,150	$253	66.73
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.19	1	0	$60	$0	0.0	$255	9,150	$255	66.73
Active Conj. Use	Sacramento	Project 2	60	$200	1.19	0.8	0	$40	$25	0.0	$275	9,150	$275	66.73
Active Conj. Use	San Joaquin	Project 3	20	$250	1.19	1	0	$60	$25	0.0	$295	9,150	$295	66.73
Active Conj. Use	Sacramento	Project 3	60	$250	1.19	0.8	0.491	$40	$25	28.0	$328	9,178	$328	67.53
Active Conj. Use	Sacramento	Project 4	60	$300	1.19	0.8	0.546	$40	$25	31.2	$380	9,209	$380	68.59
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.19	1	1	$0	$0	6.0	$399	9,215	$399	68.80
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.19	1	0.639	$60	$0	235.7	$796	9,451	$796	86.95
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.19	1	1	$0	$0	6.0	$798	9,457	$798	87.39
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.19	1	1	$0	$0	52.4	$1,261	9,509	$1,261	93.85

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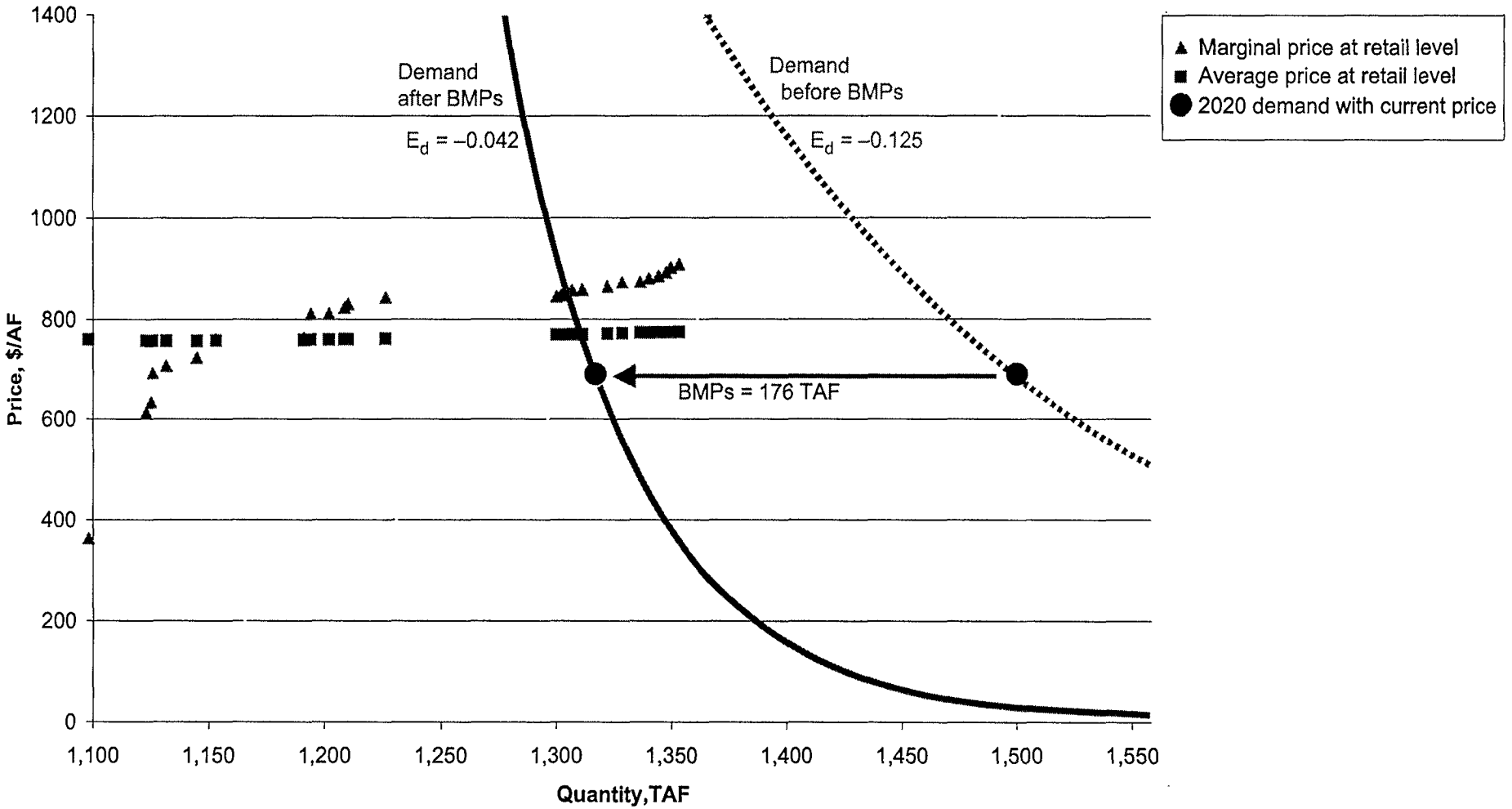

Chart 36

Screening Level Analysis
Unconstrained Preference Set With Isolated Facility Sensitivity Analysis
San Francisco Bay Region

D—013596

Table 36

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_S Quantity (TAF/year)	At Source (dry condition) C_S Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination, Retail Price Using: P_D Marginal Cost at Retail	At Destination, Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$238	$482	$520	25.0	1118.0	$362	$758
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$236	$482	$520	25.0	1,143.0	$612	$756
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$235	$482	$520	2.0	1,145.0	$632	$755
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	0%	0.094	$60	$25	$24	$0	$0	$209	$235	$482	$520	0.7	1,145.7	$691	$755
Other	Delta	South Delta Improvements	65	$110	1	1	0%	0.094	$90	$0	$24	$0	$0	$224	$235	$482	$520	6.1	1,151.8	$706	$755
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$235	$482	$520	13.0	1,164.8	$722	$755
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1	1	0%	0.164	$90	$0	$24	$0	$0	$276	$236	$482	$520	8.2	1,173.0	$758	$756
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$237	$482	$520	38.0	1,211.0	$762	$757
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	0%	0.094	$90	$25	$24	$0	$0	$327	$237	$482	$520	3.0	1,214.0	$809	$757
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$327	$238	$482	$520	7.9	1,221.8	$809	$758
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	0%	0.164	$90	$25	$24	$0	$0	$339	$238	$482	$520	6.6	1,228.4	$821	$758
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	0%	0.164	$90	$0	$24	$0	$0	$346	$238	$482	$520	1.5	1,229.9	$828	$758
Active Conj. Use	Tulare	Project 1	100	$250	1	1	0%	0.164	$60	$25	$24	$0	$0	$359	$240	$482	$520	16.4	1,246.3	$841	$760
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	0%	0.1328	$90	$0	$24	$0	$0	$360	$246	$482	$520	59.8	1,306.0	$842	$766
Additional options to the right of the demand function (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	0%	0.0312	$90	$0	$24	$0	$0	$360	$247	$482	$520	14.0	1,320.1	$842	$767
Land Fallow	San Joaquin	Range 1	12	$224	1	1	0%	0.164	$90	$25	$24	$0	$0	$363	$247	$482	$520	2.0	1,322.1	$845	$767
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$371	$247	$482	$520	1.3	1,323.4	$853	$767
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$372	$247	$482	$520	3.7	1,327.0	$854	$767
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$374	$248	$482	$520	4.2	1,331.2	$856	$768
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$249	$482	$520	11.0	1,342.2	$862	$769
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	0%	0.164	$90	$25	$24	$0	$0	$389	$250	$482	$520	6.6	1,348.8	$871	$770
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$389	$250	$482	$520	7.9	1,356.7	$871	$770
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$396	$251	$482	$520	3.7	1,360.3	$878	$771
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$401	$251	$482	$520	4.2	1,364.5	$883	$771
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$407	$252	$482	$520	3.3	1,367.8	$889	$772
Land Fallow	San Joaquin	Range 2	12	$279	1	1	0%	0.164	$90	$25	$24	$0	$0	$418	$252	$482	$520	2.0	1,369.8	$900	$772
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$424	$252	$482	$520	3.7	1,373.5	$906	$772
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$429	$253	$482	$520	4.2	1,377.7	$911	$773
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	0%	0.164	$90	$25	$24	$0	$0	$439	$254	$482	$520	6.6	1,384.2	$921	$774
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$449	$254	$482	$520	1.3	1,385.6	$931	$774
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$449	$254	$482	$520	3.3	1,388.9	$931	$774
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$452	$256	$482	$520	7.9	1,396.7	$934	$776
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$454	$256	$482	$520	3.7	1,400.4	$936	$776
Land Fallow	Sacramento	Range 12	32	$256	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$459	$257	$482	$520	4.2	1,404.6	$941	$777
Land Fallow	San Joaquin	Range 3	12	$336	1	1	0%	0.164	$90	$25	$24	$0	$0	$475	$257	$482	$520	2.0	1,406.6	$957	$777
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$265	$482	$520	50.0	1,456.6	$962	$785
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$483	$265	$482	$520	3.7	1,460.3	$965	$785
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$488	$266	$482	$520	4.2	1,464.5	$970	$786
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$493	$266	$482	$520	3.3	1,467.7	$975	$786
Land Fallow	Tulare	Range 1	67	$387	1	1	0%	0.164	$60	$25	$24	$0	$0	$496	$268	$482	$520	11.0	1,478.7	$978	$788
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$514	$269	$482	$520	7.9	1,486.6	$996	$789
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$536	$270	$482	$520	3.3	1,489.9	$1,018	$790
Land Fallow	San Joaquin	Range 4	12	$406	1	1	0%	0.164	$90	$25	$24	$0	$0	$545	$270	$482	$520	2.0	1,491.9	$1,027	$790
Land Fallow	Tulare	Range 2	67	$438	1	1	0%	0.164	$60	$25	$24	$0	$0	$547	$272	$482	$520	11.0	1,502.9	$1,029	$792
Land Fallow	Sacramento	Range 17	10	$355	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$583	$273	$482	$520	1.3	1,504.2	$1,065	$793
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	0%	0.164	$60	$25	$24	$0	$0	$584	$273	$482	$520	0.8	1,505.0	$1,066	$793
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$591	$273	$482	$520	3.3	1,508.3	$1,073	$793
Land Fallow	San Joaquin	Range 5	21	$452	1	1	0%	0.164	$90	$25	$24	$0	$0	$591	$274	$482	$520	3.4	1,511.7	$1,073	$794
Land Fallow	Tulare	Range 3	67	$490	1	1	0%	0.164	$60	$25	$24	$0	$0	$599	$276	$482	$520	11.0	1,522.7	$1,081	$796
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$279	$482	$520	10.0	1,532.7	$1,082	$799
Land Fallow	Tulare	Range 4	36	$492	1	1	0%	0.164	$60	$25	$24	$0	$0	$601	$280	$482	$520	5.9	1,538.6	$1,083	$800
Land Fallow	San Joaquin	Range 6	12	$483	1	1	0%	0.164	$90	$25	$24	$0	$0	$622	$280	$482	$520	2.0	1,540.6	$1,104	$800
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$281	$482	$520	2.0	1,542.6	$1,112	$801
Land Fallow	Tulare	Range 5	36	$540	1	1	0%	0.164	$60	$25	$24	$0	$0	$649	$282	$482	$520	5.9	1,548.5	$1,131	$802
Land Fallow	Tulare	Range 6	67	$542	1	1	0%	0.164	$60	$25	$24	$0	$0	$651	$285	$482	$520	11.0	1,559.5	$1,133	$805
Land Fallow	San Joaquin	Range 7	21	$522	1	1	0%	0.164	$90	$25	$24	$0	$0	$661	$286	$482	$520	3.4	1,562.9	$1,143	$806
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$295	$482	$520	39.0	1,601.9	$1,162	$815
Land Fallow	Tulare	Range 7	36	$588	1	1	0%	0.164	$60	$25	$24	$0	$0	$697	$297	$482	$520	5.9	1,607.8	$1,179	$817
Land Fallow	Tulare	Range 8	67	$594	1	1	0%	0.164	$60	$25	$24	$0	$0	$703	$299	$482	$520	11.0	1,618.8	$1,185	$819

D-013597

Table 36

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

Option			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Measure	Q_s Quantity (TAF/year)	C_s Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_c Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Land Fallow	Tulare	Range 9	19	$607	1	1	0%	0.164	$60	$25	$24	$0	$0	$716	$300	$482	$520	3.1	1,621.9	$1,198	$820
Land Fallow	San Joaquin	Range 8	21	$590	1	1	0%	0.164	$90	$25	$24	$0	$0	$729	$301	$482	$520	3.4	1,625.4	$1,211	$821
Land Fallow	Tulare	Range 10	36	$635	1	1	0%	0.164	$60	$25	$24	$0	$0	$744	$303	$482	$520	5.9	1,631.3	$1,226	$823
Land Fallow	Tulare	Range 11	19	$648	1	1	0%	0.164	$60	$25	$24	$0	$0	$757	$304	$482	$520	3.1	1,634.4	$1,239	$824
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$778	$304	$482	$520	1.3	1,635.7	$1,258	$824
Land Fallow	Tulare	Range 12	36	$663	1	1	0%	0.164	$60	$25	$24	$0	$0	$792	$306	$482	$520	5.9	1,641.6	$1,274	$826
Land Fallow	Tulare	Range 13	19	$668	1	1	0%	0.164	$60	$25	$24	$0	$0	$797	$307	$482	$520	3.1	1,644.7	$1,279	$827
Land Fallow	San Joaquin	Range 9	21	$659	1	1	0%	0.164	$90	$25	$24	$0	$0	$798	$308	$482	$520	3.4	1,648.2	$1,280	$828
Land Fallow	San Joaquin	Range 10	13	$694	1	1	0%	0.164	$90	$25	$24	$0	$0	$833	$308	$482	$520	2.1	1,650.3	$1,315	$828
Land Fallow	Tulare	Range 14	19	$730	1	1	0%	0.164	$60	$25	$24	$0	$0	$839	$309	$482	$520	3.1	1,653.4	$1,321	$829
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$331	$482	$520	70.0	1,723.4	$1,332	$851
Land Fallow	San Joaquin	Range 11	21	$728	1	1	0%	0.164	$90	$25	$24	$0	$0	$867	$332	$482	$520	3.4	1,726.8	$1,349	$852
Land Fallow	San Joaquin	Range 12	13	$734	1	1	0%	0.164	$90	$25	$24	$0	$0	$873	$333	$482	$520	2.1	1,729.0	$1,355	$853
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$359	$482	$520	85.0	1,814.0	$1,362	$879
Land Fallow	Tulare	Range 15	19	$771	1	1	0%	0.164	$60	$25	$24	$0	$0	$880	$360	$482	$520	3.1	1,817.1	$1,362	$880
Land Fallow	San Joaquin	Range 13	13	$775	1	1	0%	0.164	$90	$25	$24	$0	$0	$914	$360	$482	$520	2.1	1,819.2	$1,396	$880
Land Fallow	San Joaquin	Range 14	13	$815	1	1	0%	0.164	$90	$25	$24	$0	$0	$954	$361	$482	$520	2.1	1,821.4	$1,436	$881
Land Fallow	Sacramento	Range 20	10	$666	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$971	$361	$482	$520	1.3	1,822.7	$1,453	$881
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1	1	0%	0.164	$90	$0	$24	$0	$0	$990	$378	$482	$520	50.8	1,873.5	$1,472	$898
Land Fallow	San Joaquin	Range 15	13	$856	1	1	0%	0.164	$90	$25	$24	$0	$0	$995	$379	$482	$520	2.1	1,875.6	$1,477	$899
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$381	$482	$520	7.0	1,882.6	$1,487	$901
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1	1	0%	0.164	$60	$25	$24	$0	$0	$1,059	$382	$482	$520	0.8	1,883.5	$1,541	$902
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develop.	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$411	$482	$520	50.0	1,933.5	$2,012	$931
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	0%	0.164	$60	$25	$24	$0	$0	$1,609	$416	$482	$520	7.2	1,940.7	$2,091	$936
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	0%	0.164	$90	$25	$24	$0	$0	$1,639	$417	$482	$520	1.1	1,941.8	$2,121	$937
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$437	$482	$520	28.0	1,969.8	$2,362	$957
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	0%	0.16	$90	$25	$24	$0	$0	$2,014	$439	$482	$520	2.0	1,971.8	$2,496	$959

D-013598

D—013598

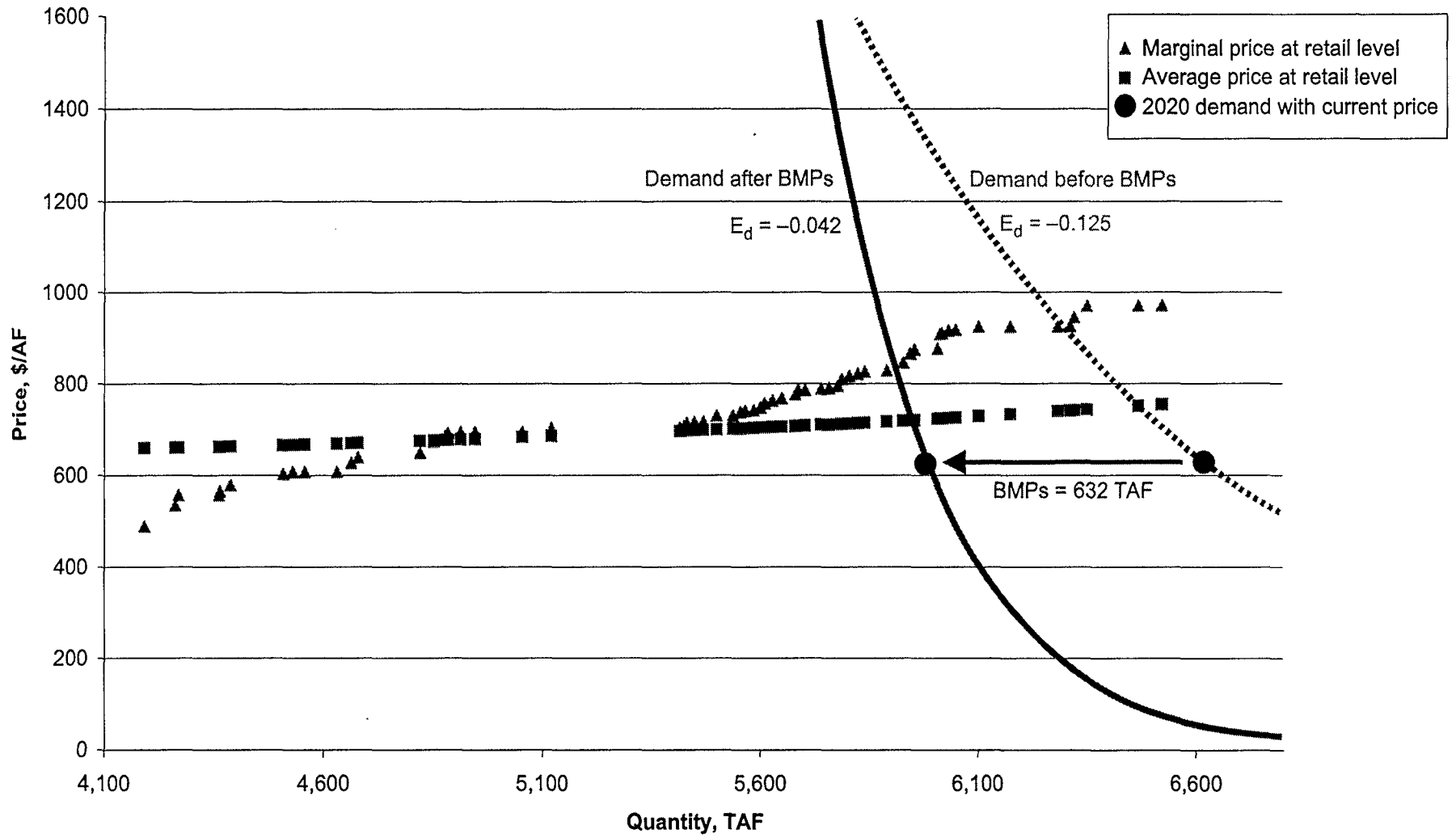

Chart 37

Screening Level Analysis
Unconstrained Preference Set With Isolated Facility Sensitivity Analysis
South Coast Region

D—013600

Table 37
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS
SOUTH COAST REGION

Option: Type	Option: Location	Option: Measure	At Source (dry condition): Q_S Quantity (TAF/year)	At Source (dry condition): C_S Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_S Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_R Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination, Retail Price Using: P_D Marginal Cost at Retail	At Destination, Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			626																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.08	1	0%	1	$50	$25	$0	$0	$0	$161	$157	$325	$600	24.0	4,191.0	$446	$657
Ag WUE	Color. River	Tailwater recovery	65	$150	1.08	1	0%	1	$50	$25	$0	$0	$0	$206	$157	$325	$600	70.9	4,261.8	$531	$657
Other	South Coast	Agriculture WUE Range 1	7	$250	1.08	1	0%	1	$0	$0	$0	$0	$0	$229	$158	$325	$600	7.6	4,268.5	$554	$658
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.08	1	0%	1	$0	$0	$0	-$50	$0	$229	$158	$325	$600	91.6	4,361.0	$554	$659
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.08	1	0%	0.344	$110	$25	$24	$0	$0	$238	$158	$325	$600	2.6	4,363.6	$563	$658
Other	Delta	South Delta Improvements	65	$110	1.08	1	0%	0.344	$140	$0	$24	$0	$0	$251	$160	$325	$600	24.4	4,388.0	$576	$660
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.08	1	0%	1	$0	$0	$0	-$100	$0	$275	$163	$325	$600	119.9	4,507.9	$600	$663
Other	Color. River	Future land fallowing agreements	100	$230	1.08	1	0%	0.18	$50	$25	$0	$0	$0	$260	$163	$325	$600	20.7	4,528.6	$605	$663
Other	Color. River	Coachella Canal lining	26	$230	1.08	1	0%	1	$50	$25	$0	$0	$0	$260	$164	$325	$600	28.3	4,557.0	$605	$664
Other	Color. River	All American Canal lining	68	$230	1.08	1	0%	1	$50	$25	$0	$0	$0	$260	$166	$325	$600	74.1	4,631.1	$605	$666
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$182	1.08	1	0%	0.601	$140	$0	$24	$0	$0	$299	$167	$325	$600	32.8	4,663.8	$624	$667
Active Conj. Use	San Joaquin	Project 1	40	$150	1.08	1	0%	0.344	$140	$25	$24	$0	$0	$311	$167	$325	$600	15.0	4,678.8	$636	$667
Other	South Coast	Conjunctive Use	130	$350	1.08	1	0%	1	$0	$0	$0	$0	$0	$321	$172	$325	$600	141.7	4,820.5	$646	$672
Active Conj. Use	Sacramento	Project 1	60	$150	1.08	0.8	0%	0.601	$140	$25	$24	$0	$0	$345	$173	$325	$600	31.4	4,852.0	$670	$673
Active Conj. Use	San Joaquin	Project 2	40	$200	1.08	1	0%	0.601	$140	$25	$24	$0	$0	$357	$174	$325	$600	26.2	4,878.2	$682	$674
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.08	1	0%	0.601	$140	$0	$24	$0	$0	$363	$174	$325	$600	5.9	4,884.1	$688	$674
Other	South Coast	Desalination Range 1	27	$500	1.08	1	0%	1	$0	$0	$0	-$100	$0	$367	$175	$325	$600	29.4	4,913.5	$692	$675
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.08	1	0%	1	$0	$0	$0	-$100	$0	$367	$177	$325	$600	32.7	4,946.2	$692	$677
Urban Recycling	South Coast	Range 1	100	$500	1.08	1	0%	1	$0	$0	$0	-$100	$0	$367	$181	$325	$600	108.0	5,055.2	$692	$681
Active Conj. Use	Tulare	Project 1	100	$250	1.08	1	0%	0.601	$110	$25	$24	$0	$0	$375	$183	$325	$600	65.5	5,120.7	$700	$683
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$344	1.08	1	0%	0.601	$140	$0	$24	$0	$0	$376	$184	$325	$600	294.8	5,415.5	$701	$684
Land Fallow	San Joaquin	Range 1	12	$224	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$379	$184	$325	$600	9.4	5,424.9	$704	$684
Land Fallow	Sacramento	Range 1	10	$185	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$386	$184	$325	$600	6.3	5,431.2	$711	$684
Land Fallow	Sacramento	Range 2	28	$187	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$388	$185	$325	$600	17.5	5,448.7	$713	$685
Land Fallow	Sacramento	Range 3	32	$188	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$389	$186	$325	$600	20.0	5,468.7	$714	$686
Active Conj. Use	San Joaquin	Project 3	40	$250	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$403	$187	$325	$600	31.3	5,500.0	$728	$687
Active Conj. Use	Sacramento	Project 2	60	$200	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$403	$188	$325	$600	37.6	5,537.6	$728	$688
Land Fallow	Sacramento	Range 4	28	$206	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$409	$189	$325	$600	17.5	5,555.1	$734	$689
Other	South Coast	Agriculture WUE Range 2	10	$450	1.08	1	0%	1	$0	$0	$0	$0	$0	$413	$189	$325	$600	10.9	5,566.0	$738	$689
Land Fallow	Sacramento	Range 5	32	$209	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$414	$200	$325	$600	20.0	5,586.1	$739	$700
Land Fallow	Sacramento	Range 6	25	$215	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$420	$201	$325	$600	15.8	5,601.8	$745	$701
Land Fallow	San Joaquin	Range 2	12	$279	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$429	$201	$325	$600	9.4	5,611.2	$754	$701
Land Fallow	Sacramento	Range 7	28	$228	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$436	$202	$325	$600	17.5	5,628.7	$760	$702
Land Fallow	Sacramento	Range 8	32	$232	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$440	$203	$325	$600	20.0	5,648.8	$765	$703
Active Conj. Use	San Joaquin	Project 4	40	$300	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$448	$204	$325	$600	31.3	5,680.1	$774	$704
Land Fallow	Sacramento	Range 9	10	$248	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$458	$204	$325	$600	6.3	5,686.4	$783	$704
Land Fallow	Sacramento	Range 10	25	$248	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$458	$205	$325	$600	15.8	5,702.2	$783	$705
Active Conj. Use	Sacramento	Project 3	60	$250	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$460	$207	$325	$600	37.6	5,739.7	$785	$707
Land Fallow	Sacramento	Range 11	28	$252	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$463	$207	$325	$600	17.5	5,757.3	$788	$707
Land Fallow	Sacramento	Range 12	32	$254	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$467	$208	$325	$600	20.0	5,777.3	$792	$708
Land Fallow	San Joaquin	Range 3	12	$336	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$482	$209	$325	$600	9.4	5,786.7	$807	$709
Land Fallow	Sacramento	Range 13	28	$275	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$489	$209	$325	$600	17.5	5,804.2	$814	$709
Land Fallow	Sacramento	Range 14	32	$279	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$493	$210	$325	$600	20.0	5,824.3	$818	$710
Land Fallow	Sacramento	Range 15	25	$283	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$498	$211	$325	$600	15.7	5,839.9	$823	$711
Land Fallow	Tulare	Range 1	67	$367	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$501	$214	$325	$600	52.4	5,892.4	$826	$714
Active Conj. Use	Sacramento	Project 4	60	$300	1.08	0.8	0%	0.229	$140	$25	$24	$0	$0	$517	$214	$325	$600	12.0	5,904.3	$842	$714
Additional options to the right of the demand function (after BMPs)																					
Active Conj. Use	Sacramento	Project 4	60	$300	1.08	0.8	0%	0.480	$140	$25	$24	$0	$0	$517	$216	$325	$600	26.6	5,929.9	$842	$716
Land Fallow	Sacramento	Range 16	25	$317	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$537	$217	$325	$600	15.8	5,945.7	$862	$717
Land Fallow	San Joaquin	Range 4	12	$406	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$545	$217	$325	$600	9.4	5,955.1	$870	$717
Land Fallow	Tulare	Range 2	67	$438	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$547	$220	$325	$600	52.4	6,007.5	$872	$720
Land Fallow	Sacramento	Range 17	10	$365	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$580	$220	$325	$600	6.3	6,013.8	$905	$720
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$582	$221	$325	$600	3.9	6,017.7	$907	$721
Land Fallow	Sacramento	Range 18	25	$362	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$588	$222	$325	$600	15.7	6,033.3	$913	$722
Land Fallow	San Joaquin	Range 5	21	$462	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$588	$223	$325	$600	16.4	6,049.8	$913	$723
Land Fallow	Tulare	Range 3	67	$480	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$595	$226	$325	$600	52.4	6,102.2	$920	$726
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.08	1	0%	1	$0	$0	$0	-$100	$0	$596	$230	$325	$600	73.0	6,175.2	$921	$730
Urban Recycling	South Coast	Range 2	100	$750	1.08	1	0%	1	$0	$0	$0	-$100	$0	$596	$236	$325	$600	108.0	6,284.2	$921	$736
Land Fallow	Tulare	Range 4	36	$492	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$597	$238	$325	$600	28.2	6,312.4	$922	$738
Land Fallow	San Joaquin	Range 6	12	$483	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$616	$239	$325	$600	9.4	6,321.8	$941	$739
Land Fallow	Tulare	Range 5	36	$540	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$642	$240	$325	$600	28.2	6,350.0	$967	$740
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.08	1	0%	1	$0	$0	$0	-$100	$0	$642	$248	$325	$600	119.9	6,469.9	$967	$748
Land Fallow	Tulare	Range 6	67	$642	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$643	$251	$325	$600	52.4	6,522.3	$968	$751
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	San Joaquin	Range 7	21	$622	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$662	$252	$325	$600	16.4	6,538.7	$977	$752
Land Fallow	Tulare	Range 7	36	$668	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$686	$254	$325	$600	28.2	6,566.9	$1,011	$754
Land Fallow	Tulare	Range 8	67	$684	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$690	$257	$325	$600	52.4	6,619.4	$1,015	$757
Land Fallow	Tulare	Range 9	19	$607	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$703	$258	$325	$600	14.9	6,634.2	$1,028	$758
Land Fallow	San Joaquin	Range 8	21	$590	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$714	$260	$325	$600	16.4	6,650.7	$1,039	$760
Land Fallow	Tulare	Range 10	36	$635	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$728	$261	$325	$600	28.2	6,678.8	$1,053	$761
Land Fallow	Tulare	Range 11	19	$648	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$741	$263	$325	$600	14.9	6,693.7	$1,066	$763
Land Fallow	Sacramento	Range 19	10	$610	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$758	$263	$325	$600	6.3	6,700.0	$1,083	$763
Land Fallow	Tulare	Range 12	36	$663	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$772	$265	$325	$600	28.2	6,728.1	$1,097	$765
Land Fallow	Tulare	Range 13	19	$688	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$777	$266	$325	$600	14.9	6,743.0	$1,102	$766
Land Fallow	San Joaquin	Range 9	21	$659	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$778	$268	$325	$600	16.4	6,759.4	$1,103	$768
Land Fallow	San Joaquin	Range 10	12	$684	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$810	$268	$325	$600	10.2	6,769.6	$1,135	$768
Land Fallow	Tulare	Range 14	19	$730	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$815	$270	$325	$600	14.9	6,784.5	$1,140	$770
Other	South Coast	Desalination Range 2	330	$1,000	1.08	1	0%	1	$0	$0	$0	-$100	$0	$826	$294	$325	$600	359.7	7,144.2	$1,151	$794
Land Fallow	San Joaquin	Range 11	21	$720	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$842	$299	$325	$600	16.4	7,160.6	$1,167	$799
Land Fallow	San Joaquin	Range 12	13	$734	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$847	$300	$325	$600	10.2	7,170.8	$1,172	$800
Land Fallow	Tulare	Range 15	19	$771	1.08	1	0%	0.718	$110	$25	$24	$0	$0	$852	$301	$325	$600	14.9	7,185.7	$1,178	$801
Land Fallow	San Joaquin	Range 13	13	$775	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$884	$302	$325	$600	10.2	7,195.9	$1,209	$802
Urban Recycling	South Coast	Range 3	100	$1,100	1.08	1	0%	1	$0	$0	$0	-$100	$0	$917	$311	$325	$600	108.0	7,304.0	$1,242	$811
Land Fallow	San Joaquin	Range 14	13	$815	1.08	1	0%	0.718	$140	$25	$24	$0	$0	$921	$312	$325	$600	10.2	7,315.0	$1,246	$812
Land Fallow	Sacramento	Range 20	10	$866	1.08	0.8	0%	0.718	$140	$25	$24	$0	$0	$937	$312	$325	$600	6.3	7,321.3	$1,262	$812
Urban WUE	South Coast	Reduce indoor CII use from 3% to 8%	19	$1,125	1.08	1	0%	1	$0	$0	$0	-$100	$0	$940	$314	$325	$600	20.7	7,342.0	$1,265	$814
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$878	1.08	1	0%	0.718	$140	$0	$24	$0	$0	$964	$334	$325	$600	242.6	7,584.6	$1,279	$834

Table 37

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS
SOUTH COAST REGION

			At Source (dry sensitivity)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Option Measure	Q_a Quantity (TAF/year)	C_a Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_S MT Brine Loss Factor	F_X Share of New Supply Factor	C_t Transport Cost	C_T Transaction Fee, $/AF	C_D Delta Water Quality Cost, $/AF	C_E Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_A Average Unit Cost $/AF	Q_b Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_R Marginal Cost at Retail	P_R Average Cost at Retail
Land Fallow	San Joaquin	Range 15	13	$855	1.09	1	0%	0.718	$140	$25	$34	$0	$0	$859	$235	$325	$500	10.2	7.594 8	$1,284	$836
Ag WUE	Tulare	Increase efficiency, Range 3	5	$850	1.09	1	0%	0.718	$110	$25	$34	$0	$0	$1,017	$236	$325	$500	3.9	7.598 7	$1,342	$836
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$238	$325	$500	20.7	7.619 4	$1,608	$836
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$361	$325	$500	108.0	7.728 4	$1,608	$861
Urban Recycling	South Coast	Range 5	436	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$405	$325	$500	474.2	8.202 5	$1,909	$905
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, extel. develop.	179	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$429	$325	$500	196.1	8.397 7	$1,747	$929
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	0%	0.718	$110	$25	$34	$0	$0	$1,522	$433	$325	$500	34.4	8.432 1	$1,847	$933
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	0%	0.718	$140	$25	$34	$0	$0	$1,560	$434	$325	$500	5.5	8.437 6	$1,875	$934
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$448	$325	$500	88.3	8.525 9	$2,068	$948
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	0%	0.718	$140	$25	$34	$0	$0	$1,984	$449	$325	$500	9.4	8.535 2	$2,219	$948

D-013601

D—013601

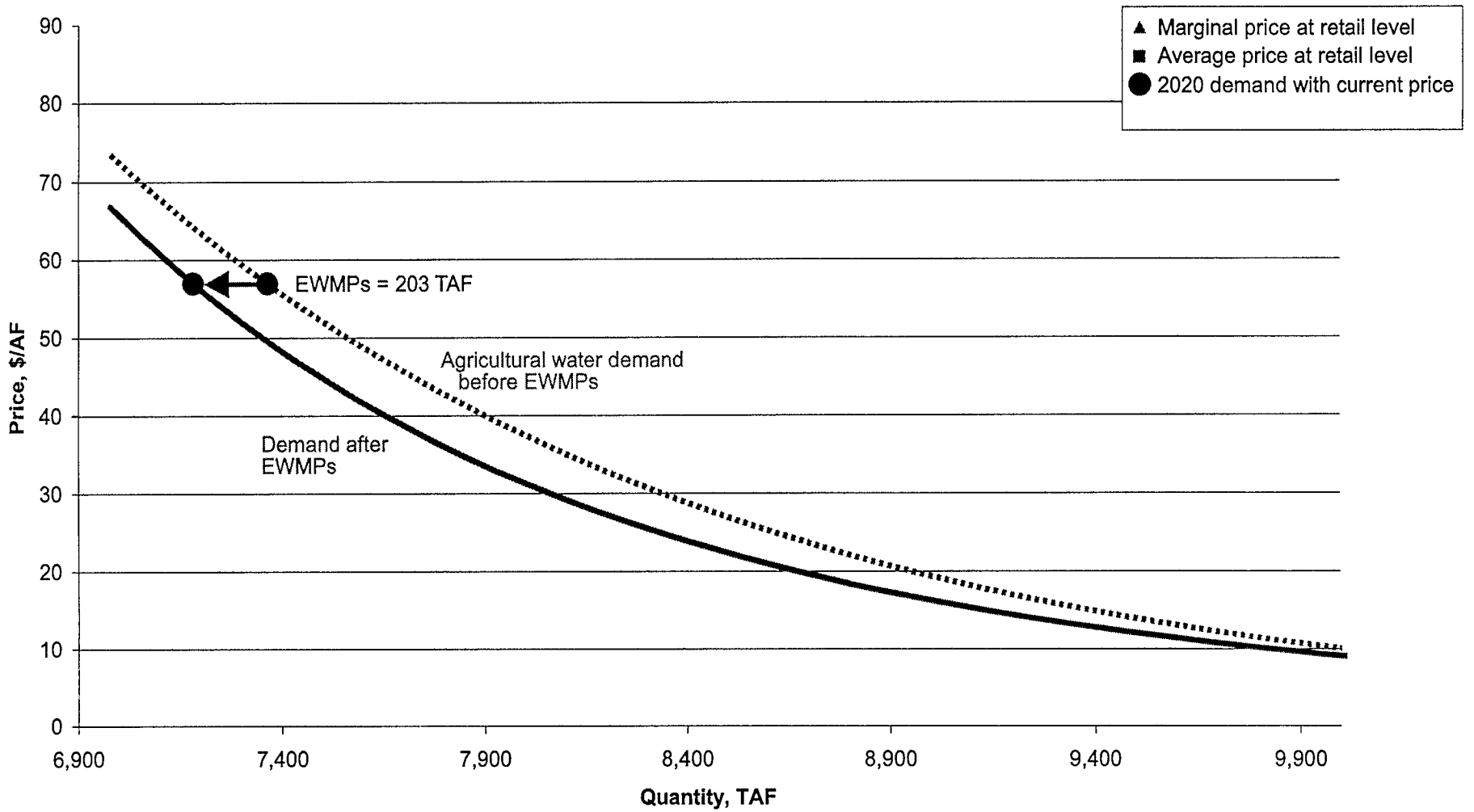

Chart 38

Screening Level Analysis
Unconstrained Preference Set With Isolated Facility Sensitivity Analysis
Sacramento River Region

D-013602

D-013602

Table 38

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS
SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

D-013603

D-013603

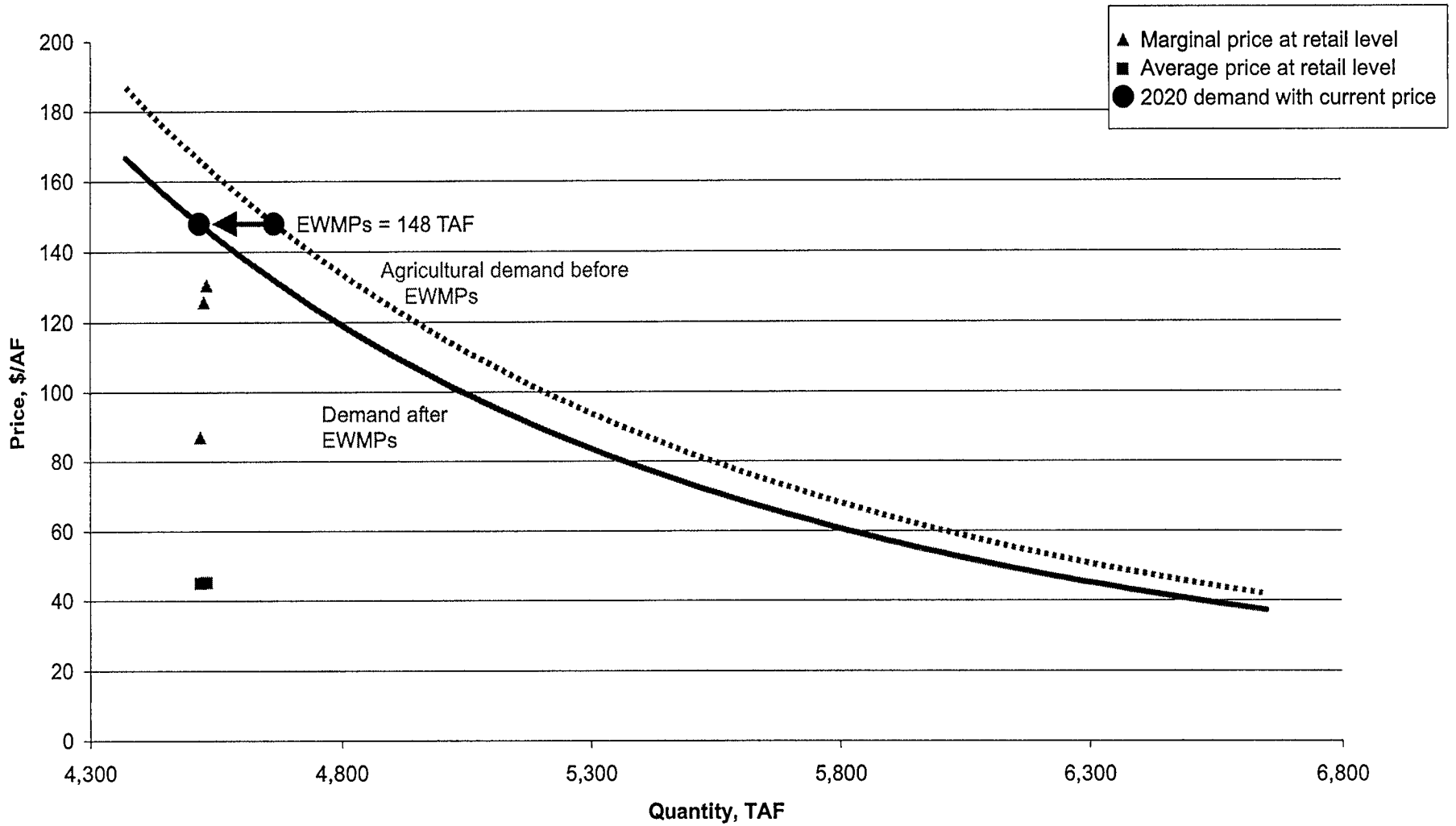

Chart 39

Screening Level Analysis
Unconstrained Preference Set With Isolated Facility Sensitivity Analysis
San Joaquin River Region

Table 39

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
										At Farm			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	South Delta Improvements	65	$110	1.15	1	0.106	$30	$0	7.9	$126	4,527	$126	$45.15
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.106	$0	$0	4.9	$130	4,532	$130	$45.24

D-013605

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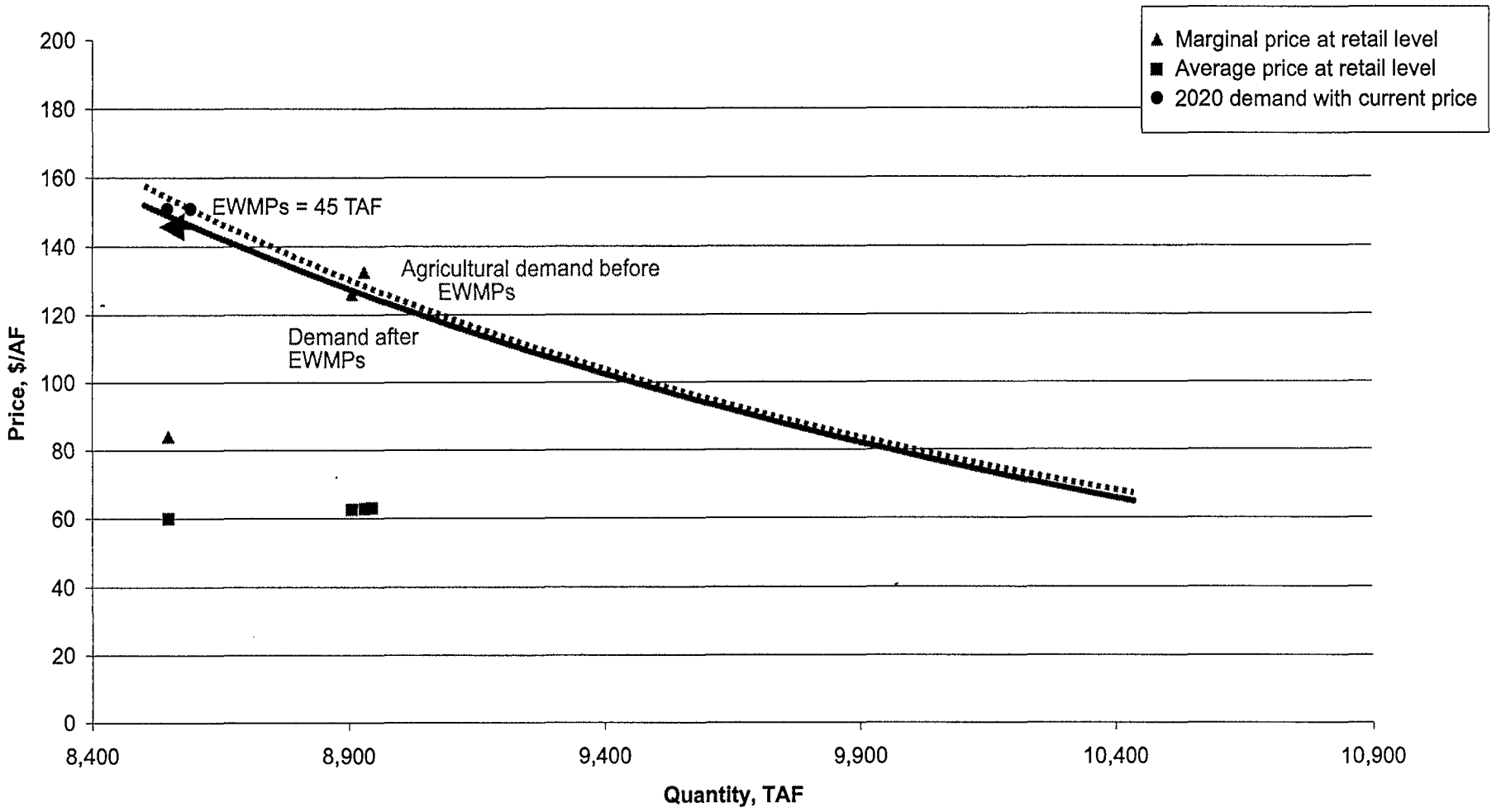

Chart 40

Screening Level Analysis
Unconstrained Preference Set With Isolated Facility Sensitivity Analysis
Tulare Lake Region

D-013606

Table 40

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, UNCONSTRAINED PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS
TULARE LAKE REGION

Option			At Source (dry condition)							At Destination				
										At Farm			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,907	$126	$62.65
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,932	$132	$62.85
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0.322	$60	$25	15.3	$211	8,947	$211	$63.10

D-013607

D-013607

D-013608

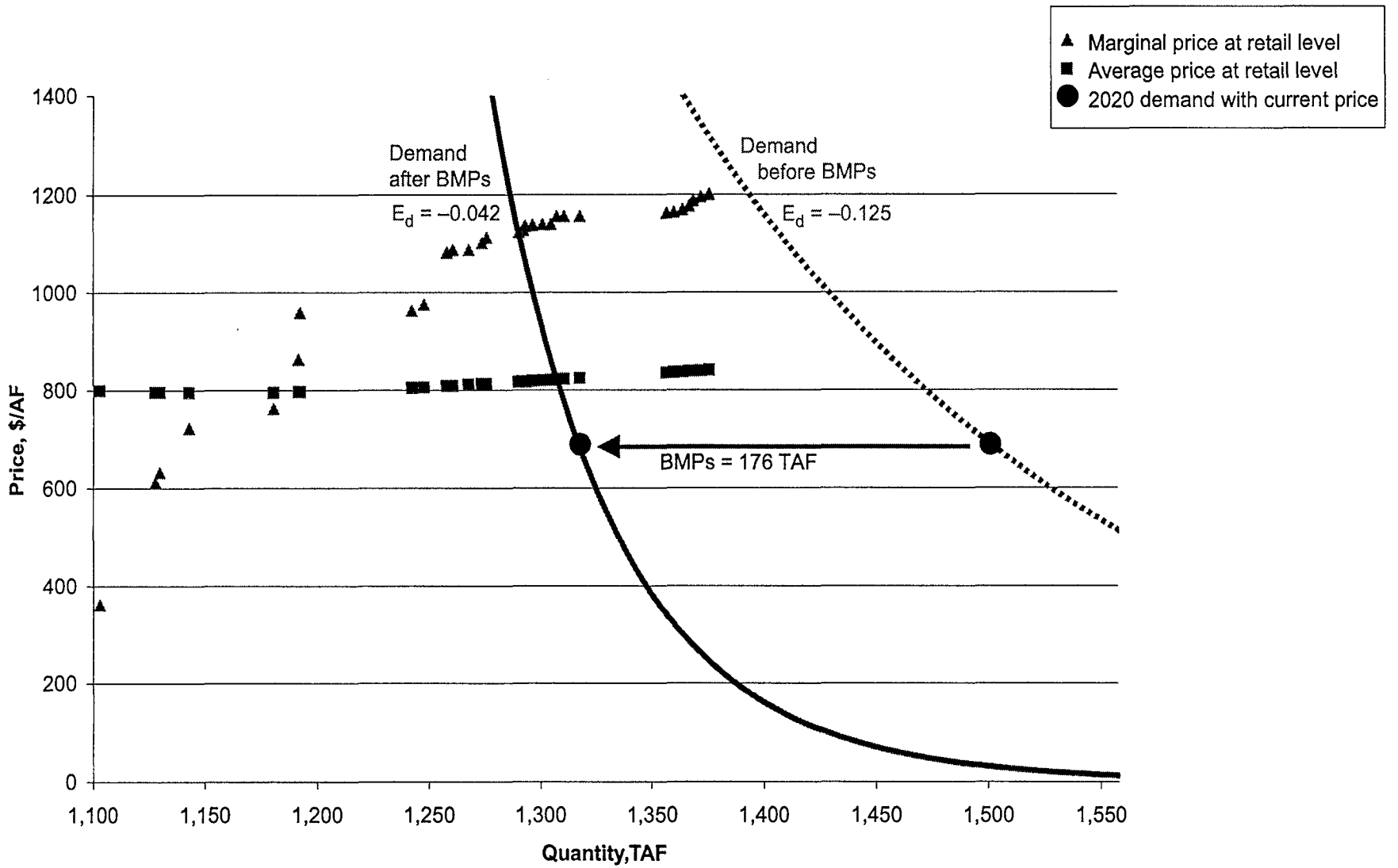

Chart 41
Screening Level Analysis
Low Yield Storage Sensitivity Analysis
San Francisco Bay Region

D—013608

Table 41
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LOW YIELD STORAGE SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$279	$482	$520	25.0	1103.0	$362	$799
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$276	$482	$520	25.0	1,128.0	$612	$796
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$275	$482	$520	2.0	1,130.0	$632	$795
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$275	$482	$520	13.0	1,143.0	$722	$795
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$275	$482	$520	38.0	1,181.0	$762	$795
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$276	$482	$520	11.0	1,192.0	$862	$796
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	10%	0.094	$60	$25	$248	$0	$0	$478	$276	$482	$520	0.6	1,192.6	$958	$796
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$284	$482	$520	50.0	1,242.6	$962	$804
Other	Delta	South Delta Improvements	65	$110	1	1	10%	0.094	$90	$0	$248	$0	$0	$493	$285	$482	$520	5.5	1,248.1	$975	$805
Other	S.F. Bay	Surface Storage	10	$800	1	1	0%	1	$0	$0	$0	$0	$0	$800	$288	$482	$520	10.0	1,258.1	$1,062	$808
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	10%	0.094	$90	$25	$248	$0	$0	$806	$289	$482	$520	2.7	1,260.8	$1,088	$809
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$806	$290	$482	$520	7.1	1,267.9	$1,088	$810
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	10%	0.164	$90	$25	$248	$0	$0	$819	$292	$482	$520	5.9	1,273.8	$1,101	$812
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$292	$482	$520	2.0	1,275.8	$1,112	$812
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.161	$60	$25	$248	$0	$0	$841	$296	$482	$520	14.5	1,290.3	$1,123	$816
Additional options to the right of the demand function (after BMPs)																					
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.003	$60	$25	$248	$0	$0	$841	$296	$482	$520	0.3	1,290.5	$1,123	$816
Land Fallow	San Joaquin	Range 1	12	$224	1	1	10%	0.164	$90	$25	$248	$0	$0	$848	$297	$482	$520	1.8	1,292.3	$1,128	$817
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$854	$297	$482	$520	1.2	1,293.5	$1,136	$817
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$856	$298	$482	$520	3.3	1,296.8	$1,138	$818
Surface Storage	Sacramento	Sac. River Onstream Low Yield Est.	30	$260	1	1	10%	0.164	$90	$0	$248	$0	$0	$858	$299	$482	$520	4.4	1,301.2	$1,140	$819
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$858	$300	$482	$520	3.8	1,305.0	$1,140	$820
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	10%	0.07	$90	$25	$248	$0	$0	$874	$301	$482	$520	2.5	1,307.5	$1,156	$821
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$874	$303	$482	$520	7.1	1,314.6	$1,156	$823
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$314	$482	$520	39.0	1,353.6	$1,162	$834
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$682	$315	$482	$520	3.3	1,356.9	$1,164	$835
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$687	$316	$482	$520	3.8	1,360.7	$1,169	$836
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$695	$317	$482	$520	3.0	1,363.7	$1,177	$837
Land Fallow	San Joaquin	Range 2	12	$279	1	1	10%	0.164	$90	$25	$248	$0	$0	$706	$317	$482	$520	1.8	1,365.4	$1,188	$837
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$713	$318	$482	$520	3.3	1,368.8	$1,195	$838
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$718	$319	$482	$520	3.8	1,372.5	$1,200	$839
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	10%	0.164	$90	$25	$248	$0	$0	$729	$321	$482	$520	5.9	1,378.4	$1,211	$841
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$321	$482	$520	1.2	1,379.6	$1,222	$841
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$322	$482	$520	3.0	1,382.6	$1,222	$842
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$743	$324	$482	$520	7.1	1,389.7	$1,225	$844
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$746	$325	$482	$520	3.3	1,393.0	$1,228	$845
Land Fallow	Sacramento	Range 12	32	$256	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$751	$327	$482	$520	3.8	1,396.8	$1,233	$847
Land Fallow	San Joaquin	Range 3	12	$336	1	1	10%	0.164	$90	$25	$248	$0	$0	$759	$327	$482	$520	1.8	1,398.5	$1,251	$847
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$777	$328	$482	$520	3.3	1,401.8	$1,259	$848
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$783	$329	$482	$520	3.8	1,405.6	$1,265	$849
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$788	$330	$482	$520	3.0	1,408.6	$1,270	$850
Land Fallow	Tulare	Range 1	67	$387	1	1	10%	0.184	$60	$25	$248	$0	$0	$792	$334	$482	$520	9.9	1,418.5	$1,274	$854
Surface Storage	Sacramento	Sac. River Offstream Low Yield Est.	190	$382	1	1	10%	0.02	$90	$0	$248	$0	$0	$792	$335	$482	$520	3.4	1,421.9	$1,274	$855
Surface Storage	Sacramento	Sac. River Offstream Low Yield Est.	190	$382	1	1	10%	0.144	$90	$0	$248	$0	$0	$792	$343	$482	$520	24.6	1,446.5	$1,274	$863
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$812	$345	$482	$520	7.1	1,453.6	$1,294	$865
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$836	$348	$482	$520	3.0	1,456.6	$1,318	$866
Land Fallow	San Joaquin	Range 4	12	$406	1	1	10%	0.164	$90	$25	$248	$0	$0	$845	$348	$482	$520	1.8	1,458.3	$1,327	$866
Land Fallow	Tulare	Range 2	67	$438	1	1	10%	0.184	$60	$25	$248	$0	$0	$848	$350	$482	$520	9.9	1,468.2	$1,330	$870
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$373	$482	$520	70.0	1,538.2	$1,332	$893
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$399	$482	$520	85.0	1,623.2	$1,362	$919
Surface Storage	San Joaquin	S. Joaq. River Offstream Low Yield Est.	5	$484	1	1	10%	0.164	$90	$0	$248	$0	$0	$882	$399	$482	$520	0.7	1,624.0	$1,364	$919
Land Fallow	Sacramento	Range 17	10	$356	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$887	$400	$482	$520	1.2	1,625.1	$1,369	$920
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	10%	0.164	$60	$25	$248	$0	$0	$889	$400	$482	$520	0.7	1,625.9	$1,371	$920
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$896	$401	$482	$520	3.0	1,628.8	$1,378	$921
Land Fallow	San Joaquin	Range 5	21	$452	1	1	10%	0.164	$90	$25	$248	$0	$0	$897	$402	$482	$520	3.1	1,631.9	$1,379	$922
Land Fallow	Tulare	Range 3	67	$490	1	1	10%	0.164	$60	$25	$248	$0	$0	$905	$405	$482	$520	9.9	1,641.8	$1,387	$925
Land Fallow	Tulare	Range 4	36	$492	1	1	10%	0.164	$60	$25	$248	$0	$0	$908	$406	$482	$520	5.3	1,647.1	$1,390	$926
Land Fallow	San Joaquin	Range 6	12	$483	1	1	10%	0.164	$90	$25	$248	$0	$0	$930	$407	$482	$520	1.8	1,648.9	$1,412	$927
Land Fallow	Tulare	Range 5	36	$540	1	1	10%	0.164	$60	$25	$248	$0	$0	$961	$409	$482	$520	5.3	1,654.2	$1,443	$929
Land Fallow	Tulare	Range 6	67	$542	1	1	10%	0.164	$60	$25	$248	$0	$0	$962	$412	$482	$520	9.9	1,664.1	$1,444	$932
Land Fallow	San Joaquin	Range 7	21	$522	1	1	10%	0.164	$90	$25	$248	$0	$0	$973	$413	$482	$520	3.1	1,667.2	$1,455	$933
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$416	$482	$520	7.0	1,674.2	$1,487	$936
Land Fallow	Tulare	Range 7	36	$588	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,013	$417	$482	$520	5.3	1,679.5	$1,496	$937
Land Fallow	Tulare	Range 8	67	$594	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,019	$421	$482	$520	9.9	1,689.4	$1,501	$941
Land Fallow	Tulare	Range 9	19	$607	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,034	$422	$482	$520	2.8	1,692.2	$1,516	$942
Land Fallow	San Joaquin	Range 8	21	$590	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,048	$423	$482	$520	3.1	1,695.3	$1,530	$943
Land Fallow	Tulare	Range 10	36	$635	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,066	$425	$482	$520	5.3	1,700.6	$1,547	$945
Land Fallow	Tulare	Range 11	19	$648	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,079	$426	$482	$520	2.8	1,703.4	$1,561	$946
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,100	$427	$482	$520	1.2	1,704.6	$1,582	$947

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D-013609

Table 41
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LOW YIELD STORAGE SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_S MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_G Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Land Fallow	Tulare	Range 12	36	$683	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,118	$429	$482	$520	5.3	1,709.9	$1,600	$949
Land Fallow	Tulare	Range 13	19	$686	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,123	$430	$482	$520	2.8	1,712.7	$1,605	$950
Land Fallow	San Joaquin	Range 9	21	$659	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,124	$431	$482	$520	3.1	1,715.8	$1,606	$951
Land Fallow	San Joaquin	Range 10	13	$694	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,162	$432	$482	$520	1.9	1,717.8	$1,644	$952
Land Fallow	Tulare	Range 14	19	$730	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,169	$433	$482	$520	2.8	1,720.6	$1,651	$953
Land Fallow	San Joaquin	Range 11	21	$728	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,201	$435	$482	$520	3.1	1,723.7	$1,683	$955
Land Fallow	San Joaquin	Range 12	13	$734	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,206	$435	$482	$520	1.9	1,725.6	$1,688	$955
Land Fallow	Tulare	Range 15	19	$771	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,214	$437	$482	$520	2.8	1,728.4	$1,696	$957
Land Fallow	San Joaquin	Range 13	13	$775	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,252	$438	$482	$520	1.9	1,730.3	$1,734	$958
Land Fallow	San Joaquin	Range 14	13	$815	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,296	$439	$482	$520	1.9	1,732.2	$1,778	$959
Land Fallow	Sacramento	Range 20	10	$666	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,315	$439	$482	$520	1.2	1,733.4	$1,797	$959
Land Fallow	San Joaquin	Range 15	13	$856	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,341	$440	$482	$520	1.9	1,735.3	$1,823	$960
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,411	$441	$482	$520	0.7	1,736.1	$1,893	$961
Surface Storage	San Joaquin	Aqueduct Offstream Low Yield Est.	170	$1,022	1	1	10%	0.164	$90	$0	$248	$0	$0	$1,496	$458	$482	$520	25.1	1,761.1	$1,978	$976
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develop.	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$485	$482	$520	50.0	1,811.1	$2,012	$1,005
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$507	$482	$520	28.0	1,839.1	$2,362	$1,027
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	10%	0.164	$60	$25	$248	$0	$0	$2,016	$512	$482	$520	6.5	1,845.6	$2,498	$1,032
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	10%	0.164	$90	$25	$248	$0	$0	$2,049	$513	$482	$520	1.0	1,846.7	$2,531	$1,033
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	10%	0.16	$90	$25	$248	$0	$0	$2,462	$515	$482	$520	1.8	1,848.4	$2,944	$1,035

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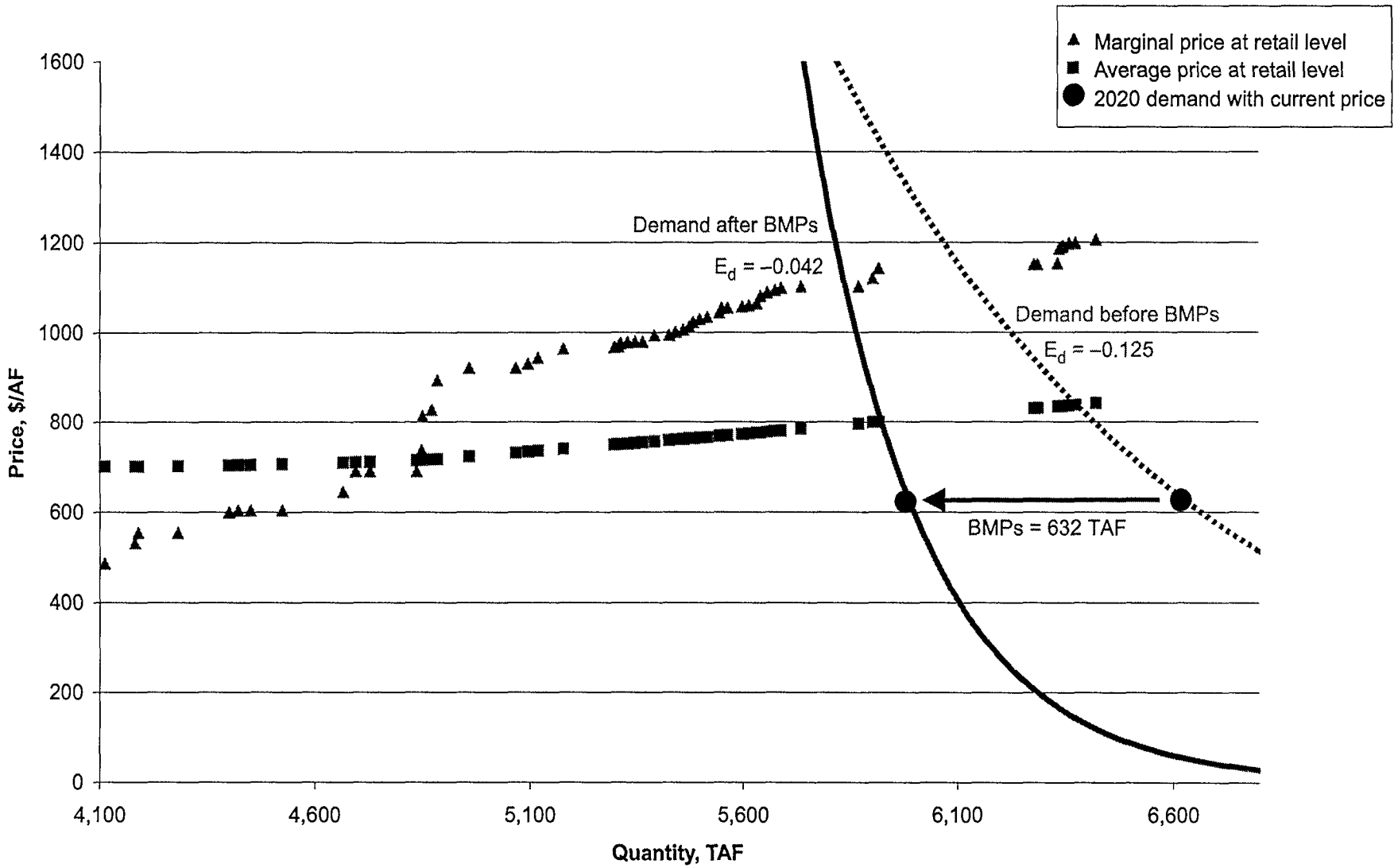

Chart 42
Screening Level Analysis
Low Yield Storage Sensitivity Analysis
South Coast Region

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D-013612

Table 42
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LOW YIELD STORAGE SENSITIVITY ANALYSIS
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination, Retail Price Using: P_D Marginal Cost at Retail	At Destination, Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$202	$325	$500	24.0	4111.0	$486	$702
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$202	$325	$500	70.9	4,181.8	$531	$702
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$202	$325	$500	7.6	4,189.5	$554	$702
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$202	$325	$500	91.6	4,281.0	$554	$702
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$204	$325	$500	119.9	4,400.9	$600	$704
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$205	$325	$500	20.7	4,421.6	$605	$705
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$205	$325	$500	28.3	4,450.0	$605	$706
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$207	$325	$500	74.1	4,524.1	$605	$707
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$210	$325	$500	141.7	4,665.8	$646	$710
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$211	$325	$500	29.4	4,695.2	$692	$711
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$212	$325	$500	32.7	4,727.9	$692	$712
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$216	$325	$500	109.0	4,836.9	$692	$716
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$216	$325	$500	10.9	4,847.8	$738	$716
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$248	$0	$0	$487	$216	$325	$500	2.4	4,850.2	$812	$716
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.344	$140	$0	$248	$0	$0	$503	$217	$325	$500	21.9	4,872.1	$828	$717
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.344	$140	$25	$248	$0	$0	$568	$218	$325	$500	13.5	4,885.6	$893	$718
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$224	$325	$500	73.0	4,958.6	$921	$724
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$232	$325	$500	109.0	5,067.6	$921	$732
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	10%	0.601	$140	$25	$248	$0	$0	$606	$234	$325	$500	28.3	5,095.9	$931	$734
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	10%	0.601	$140	$25	$248	$0	$0	$619	$236	$325	$500	23.6	5,119.5	$944	$736
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	10%	0.601	$110	$25	$248	$0	$0	$639	$240	$325	$500	59.0	5,178.5	$964	$740
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$250	$325	$500	119.9	5,298.4	$967	$750
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$643	$250	$325	$500	8.5	5,306.8	$968	$750
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$651	$251	$325	$500	5.6	5,312.5	$976	$751
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$652	$252	$325	$500	15.8	5,328.3	$977	$752
Surface Storage	Sacramento	Sac. River Onstream Low Yield Est.	30	$260	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$654	$253	$325	$500	21.1	5,349.4	$979	$753
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$654	$255	$325	$500	18.0	5,367.4	$979	$755
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$669	$257	$325	$500	28.2	5,395.6	$994	$757
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$669	$259	$325	$500	33.8	5,429.4	$994	$759
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$676	$261	$325	$500	15.8	5,445.2	$1,001	$761
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$681	$262	$325	$500	18.0	5,463.2	$1,006	$762
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$688	$263	$325	$500	14.2	5,477.4	$1,013	$763
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$698	$264	$325	$500	8.5	5,485.8	$1,023	$764
Land Fallow	Sacramento	Range 7	28	$228	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$705	$265	$325	$500	15.8	5,501.6	$1,030	$765
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$710	$266	$325	$500	18.0	5,519.7	$1,035	$766
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$720	$269	$325	$500	28.2	5,547.8	$1,045	$769
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$269	$325	$500	5.7	5,553.5	$1,055	$769
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$270	$325	$500	14.2	5,567.7	$1,055	$770
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$732	$273	$325	$500	33.8	5,601.5	$1,057	$773
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$735	$275	$325	$500	15.8	5,617.3	$1,060	$775
Land Fallow	Sacramento	Range 12	32	$256	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$740	$276	$325	$500	18.0	5,635.3	$1,065	$776
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$756	$277	$325	$500	8.5	5,643.8	$1,081	$777
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$763	$278	$325	$500	15.8	5,659.6	$1,088	$778
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$768	$280	$325	$500	18.0	5,677.6	$1,093	$780
Land Fallow	Sacramento	Range 15	25	$283	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$774	$281	$325	$500	14.1	5,691.7	$1,099	$781
Land Fallow	Tulare	Range 1	67	$387	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$777	$285	$325	$500	47.2	5,738.9	$1,102	$785
Surface Storage	Sacramento	Sac. River Offstream Low Yield Est.	190	$382	1.09	1	10%	0.532	$140	$0	$248	$0	$0	$777	$293	$325	$500	99.2	5,838.0	$1,102	$793
Additional options to the right of the demand function (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream Low Yield Est.	190	$382	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$777	$304	$325	$500	133.8	5,971.9	$1,102	$804
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$795	$307	$325	$500	33.8	6,005.7	$1,120	$807
Land Fallow	Sacramento	Range 16	25	$317	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$817	$308	$325	$500	14.2	6,019.8	$1,142	$808
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$337	$325	$500	359.7	6,379.5	$1,151	$837
Land Fallow	San Joaquin	Range 4	12	$406	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$826	$338	$325	$500	8.5	6,388.0	$1,151	$838
Land Fallow	Tulare	Range 2	67	$438	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$828	$342	$325	$500	47.2	6,435.2	$1,153	$842
Surface Storage	San Joaquin	S. Joaq. River Offstream Low Yield Est.	5	$484	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$860	$342	$325	$500	2.9	6,438.1	$1,185	$842
Land Fallow	Sacramento	Range 17	10	$365	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$864	$342	$325	$500	5.6	6,443.8	$1,189	$842
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$866	$343	$325	$500	3.5	6,447.3	$1,191	$843
Land Fallow	Sacramento	Range 18	25	$362	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$873	$344	$325	$500	14.1	6,461.4	$1,198	$844
Land Fallow	San Joaquin	Range 5	21	$452	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$873	$345	$325	$500	14.8	6,476.2	$1,198	$845
Land Fallow	Tulare	Range 3	67	$490	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$881	$349	$325	$500	47.2	6,523.4	$1,206	$849
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Tulare	Range 4	36	$492	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$883	$351	$325	$500	25.4	6,548.7	$1,208	$851
Land Fallow	San Joaquin	Range 6	12	$483	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$904	$352	$325	$500	8.5	6,557.2	$1,229	$852
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$361	$325	$500	109.0	6,666.2	$1,242	$861
Land Fallow	Tulare	Range 5	36	$540	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$932	$363	$325	$500	25.4	6,691.5	$1,257	$863

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Table 42

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LOW YIELD STORAGE SENSITIVITY ANALYSIS
SOUTH COAST REGION

			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination			
																				Retail Price Using:	
		Option	Q_O	C_O	F_R	F_D	F_B	F_A	C_C	C_T	C_Q	C_R	C_W			P_M	P_N	Q_D		P_D	P_B
Type	Location	Measure	Quantity (TAF/year)	Unit Cost ($/AF)	Reapplication Factor	Delta Loss Factor	MT Brine Loss Factor	Share of New Supply Factor	Transport Cost	Transaction Fee, $/AF	Delta Water Quality Cost, $/AF	Water Use Efficiency & Recycling Avoided Cost, $/AF	Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	Marginal Unit Cost $/AF	Average Unit Cost $/AF	Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	Marginal Cost at Retail	Average Cost at Retail
Land Fallow	Tulare	Range 6	67	$542	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$933	$367	$325	$500	47.2	6,738.7	$1,258	$867
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$369	$325	$500	20.7	6,759.4	$1,265	$869
Land Fallow	San Joaquin	Range 7	21	$522	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$943	$370	$325	$500	14.8	6,774.2	$1,268	$870
Land Fallow	Tulare	Range 7	36	$588	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$960	$372	$325	$500	25.4	6,799.6	$1,305	$872
Land Fallow	Tulare	Range 8	67	$594	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$986	$376	$325	$500	47.2	6,846.8	$1,311	$876
Land Fallow	Tulare	Range 9	19	$607	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$999	$378	$325	$500	13.4	6,860.2	$1,324	$878
Land Fallow	San Joaquin	Range 8	21	$590	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,012	$379	$325	$500	14.8	6,874.9	$1,337	$879
Land Fallow	Tulare	Range 10	36	$635	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,027	$381	$325	$500	25.4	6,900.3	$1,352	$881
Land Fallow	Tulare	Range 11	19	$648	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,041	$383	$325	$500	13.4	6,913.7	$1,366	$883
Land Fallow	Sacramento	Range 19	10	$510	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,060	$383	$325	$500	5.6	6,919.3	$1,385	$883
Land Fallow	Tulare	Range 12	36	$683	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,076	$386	$325	$500	25.4	6,944.7	$1,401	$886
Land Fallow	Tulare	Range 13	19	$688	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,081	$387	$325	$500	13.4	6,958.1	$1,406	$887
Land Fallow	San Joaquin	Range 9	21	$659	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,082	$389	$325	$500	14.8	6,972.9	$1,407	$889
Land Fallow	San Joaquin	Range 10	13	$684	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,117	$390	$325	$500	9.2	6,982.0	$1,442	$890
Land Fallow	Tulare	Range 14	19	$730	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,123	$391	$325	$500	13.4	6,995.4	$1,448	$891
Land Fallow	San Joaquin	Range 11	21	$728	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,152	$393	$325	$500	14.8	7,010.2	$1,477	$893
Land Fallow	San Joaquin	Range 12	13	$734	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,157	$394	$325	$500	9.2	7,019.3	$1,482	$894
Land Fallow	Tulare	Range 15	19	$771	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,165	$395	$325	$500	13.4	7,032.7	$1,490	$895
Land Fallow	San Joaquin	Range 13	13	$775	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,199	$396	$325	$500	9.2	7,041.9	$1,524	$896
Land Fallow	San Joaquin	Range 14	13	$815	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,239	$397	$325	$500	9.2	7,051.0	$1,564	$897
Land Fallow	Sacramento	Range 20	10	$666	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,257	$398	$325	$500	5.6	7,056.7	$1,582	$898
Land Fallow	San Joaquin	Range 15	13	$856	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,281	$399	$325	$500	9.2	7,065.8	$1,606	$899
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$402	$325	$500	20.7	7,086.5	$1,609	$902
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$415	$325	$500	109.0	7,195.5	$1,609	$915
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$469	$325	$500	474.2	7,669.7	$1,609	$969
Ag WUE	Tulare	Increase efficiency, Range 3	5	$960	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,345	$469	$325	$500	3.5	7,673.2	$1,670	$969
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,650	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$493	$325	$500	195.1	7,868.3	$1,747	$993
Surface Storage	San Joaquin	Aqueduct Offstream Low Yield Est.	170	$1,022	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$1,423	$507	$325	$500	119.7	7,988.1	$1,748	$1,007
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$520	$325	$500	88.3	8,076.3	$2,068	$1,020
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,900	$525	$325	$500	31.0	8,107.3	$2,225	$1,025
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,931	$526	$325	$500	4.9	8,112.3	$2,256	$1,026
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$2,309	$528	$325	$500	8.5	8,120.7	$2,634	$1,028

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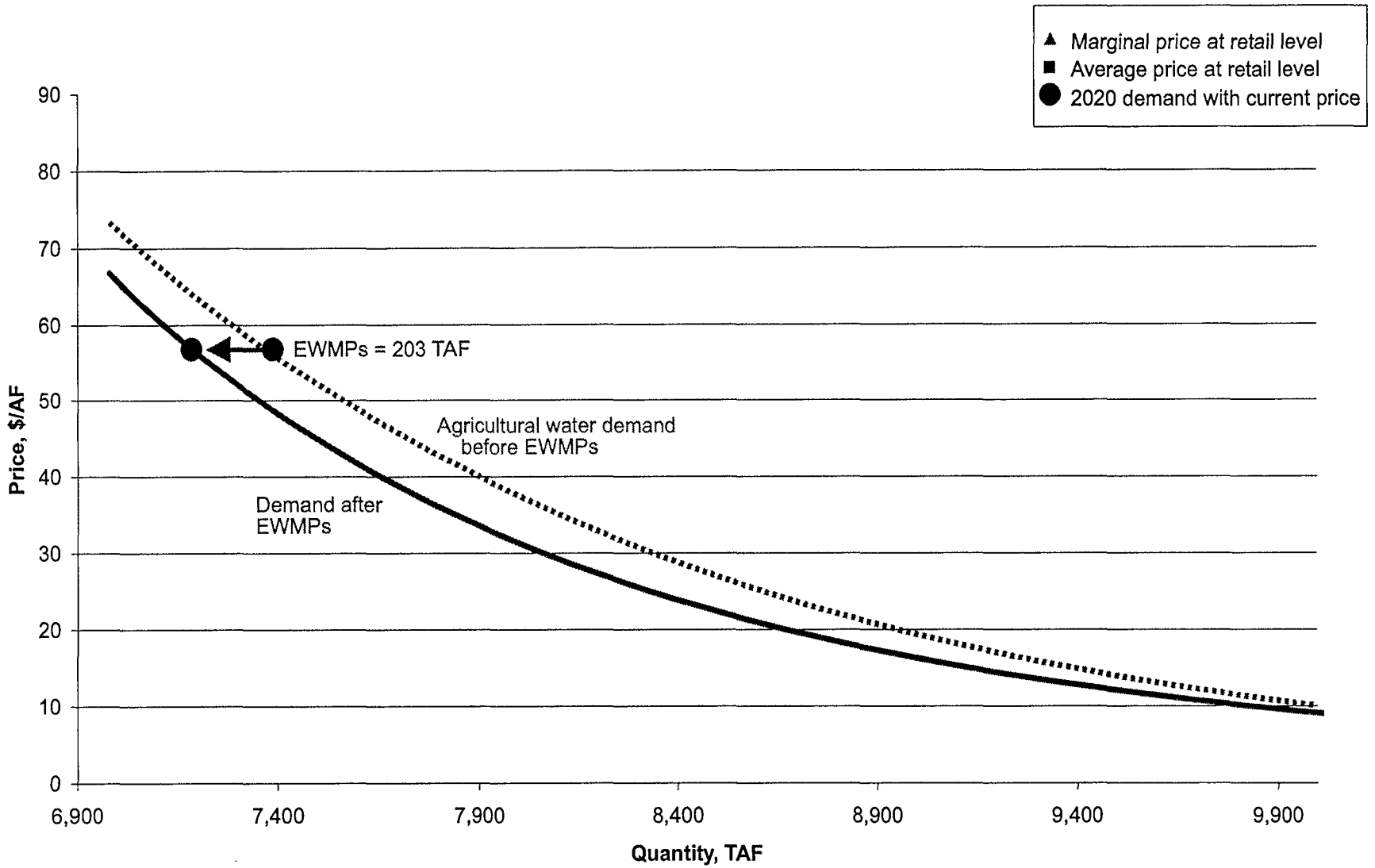

Chart 43
Screening Level Analysis
Low Yield Storage Sensitivity Analysis
Sacramento River Region

Table 43

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LOW YIELD STORAGE SENSITIVITY ANALYSIS
SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

Options screened to meet demand

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D-013615

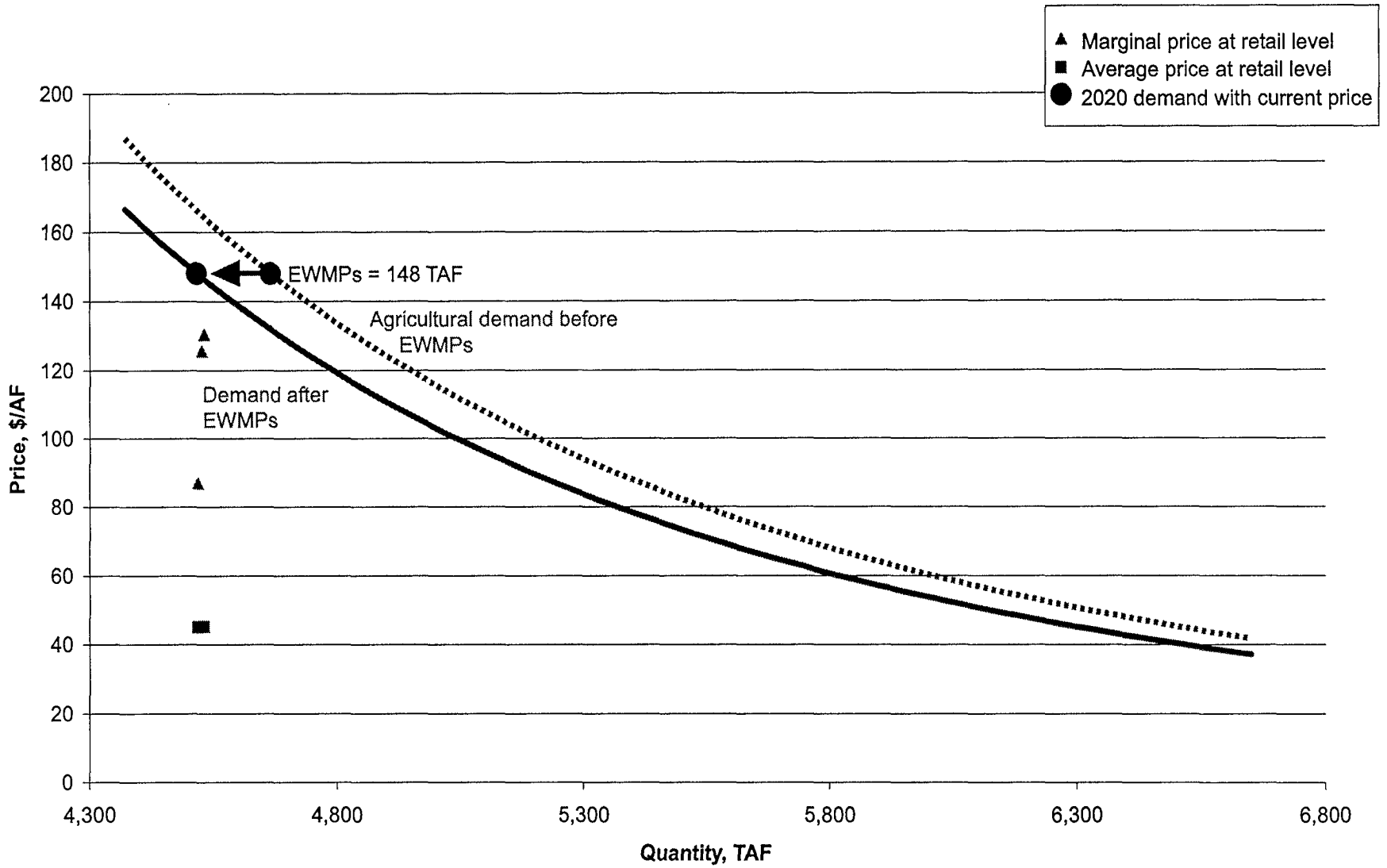

Chart 44
Screening Level Analysis
Low Yield Storage Sensitivity Analysis
San Joaquin River Region

Table 44

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LOW YIELD STORAGE SENSITIVITY ANALYSIS
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
										At Farm			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	South Delta Improvements	65	$110	1.15	1	0.106	$30	$0	7.9	$126	4,527	$126	$45.15
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.106	$0	$0	4.9	$130	4,532	$130	$45.24

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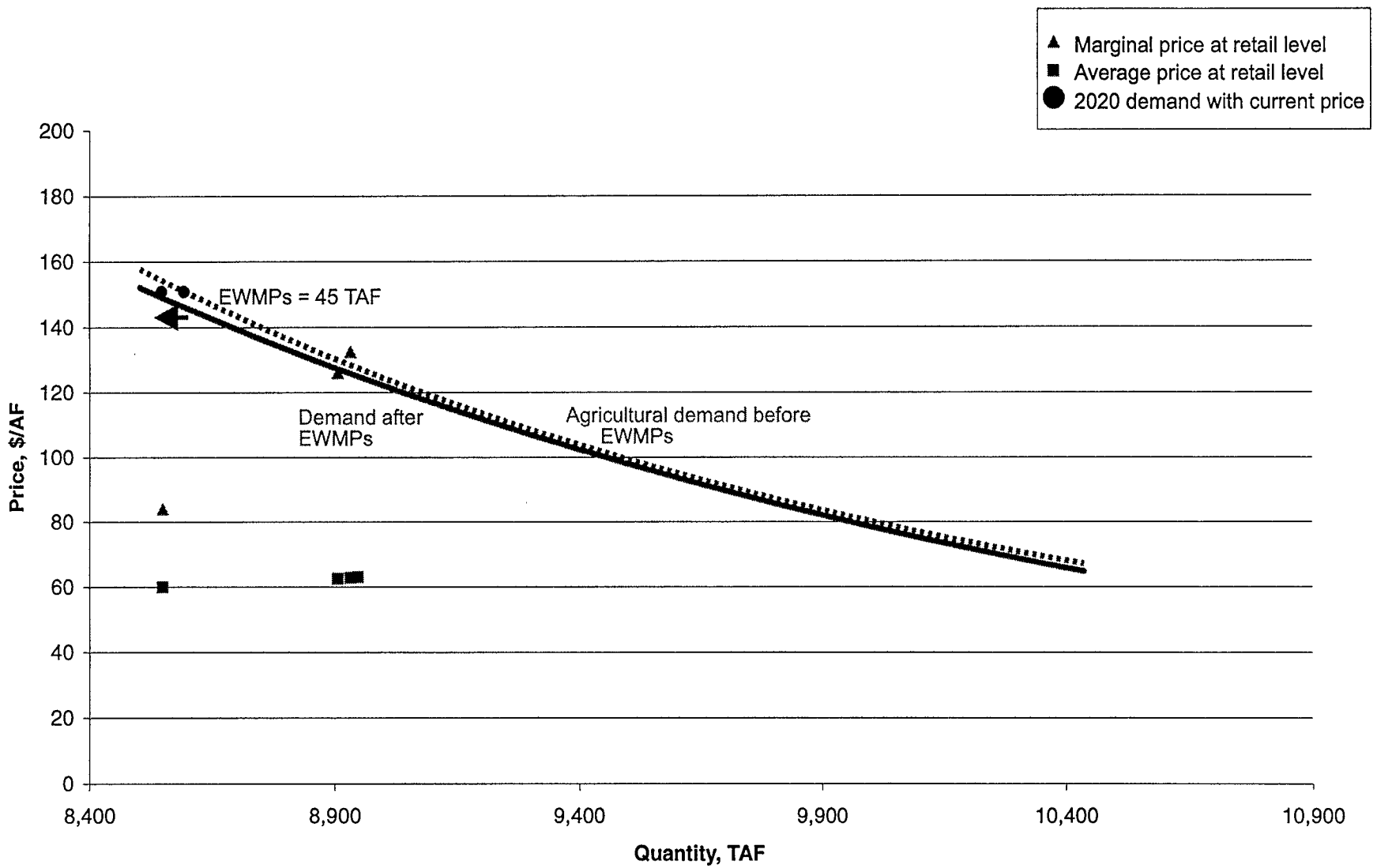

Chart 45

Screening Level Analysis
Low Yield Storage Sensitivity Analysis
Tulare Lake Region

D-013618

Table 45

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LOW YIELD STORAGE SENSITIVITY ANALYSIS
TULARE LAKE REGION

Option			At Source (dry condition)							At Destination			Retail Price Using:	
			Q_O	C_O	F_R	F_D	F_A	C_C	C_T	At Farm			P_D	P_D
Type	Location	Measure	Quantity (TAF/year)	Unit Cost ($/AF)	Reappli-cation Factor	Delta Loss Factor	Share of New Supply Factor	Transport Cost	Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	Marginal Cost at Retail	Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,907	$126	$62.65
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,932	$132	$62.85

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D-013619

D-013620

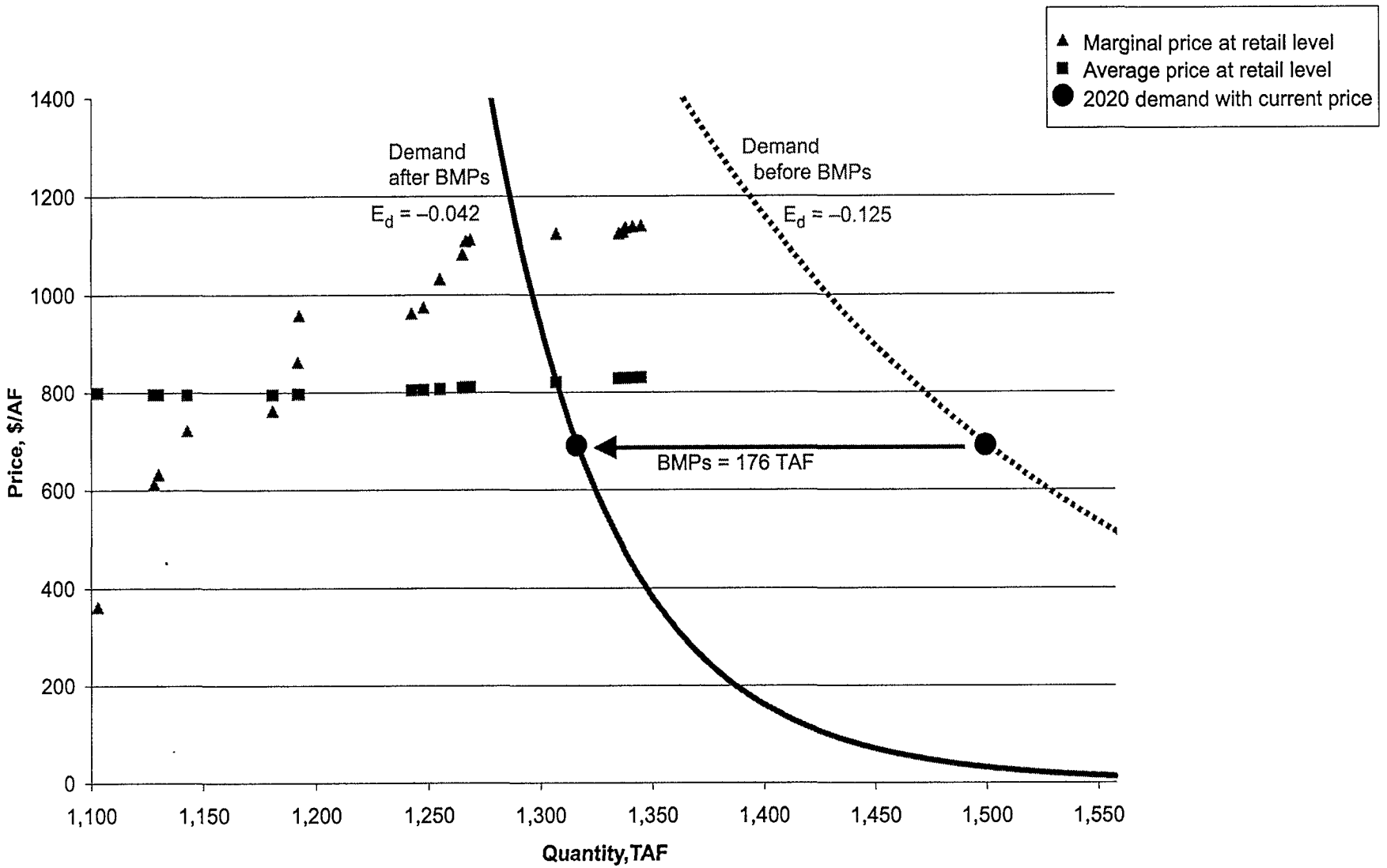

Chart 46
Screening Level Analysis
No Conjunctive Use Sensitivity Analysis
San Francisco Bay Region

D—013620

Table 46

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, NO CONJUNCTIVE USE SENSITIVITY ANALYSIS

SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_D Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive P_M Marginal Unit Cost $/AF	Retail Cost Additive P_M Average Unit Cost $/AF	At Destination Q_D Retail Quantity (TAF/year)	At Destination Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$279	$482	$520	25.0	1103.0	$362	$799
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$276	$482	$520	25.0	1,128.0	$612	$796
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$275	$482	$520	2.0	1,130.0	$632	$795
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$275	$482	$520	13.0	1,143.0	$722	$795
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	36	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$275	$482	$520	38.0	1,181.0	$762	$795
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$276	$482	$520	11.0	1,192.0	$862	$796
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	10%	0.094	$60	$25	$248	$0	$0	$476	$276	$482	$520	0.6	1,192.6	$958	$796
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$284	$482	$520	50.0	1,242.6	$962	$804
Other	Delta	South Delta improvements	65	$110	1	1	10%	0.094	$90	$0	$248	$0	$0	$493	$285	$482	$520	5.5	1,248.1	$975	$806
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	60	$182	1	1	10%	0.164	$90	$0	$248	$0	$0	$550	$287	$482	$520	7.4	1,255.5	$1,032	$807
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$289	$482	$520	10.0	1,265.5	$1,082	$809
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	10%	0.164	$90	$0	$248	$0	$0	$627	$290	$482	$520	1.3	1,266.8	$1,109	$810
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$290	$482	$520	2.0	1,268.8	$1,112	$810
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.053	$90	$0	$248	$0	$0	$642	$296	$482	$520	21.5	1,290.3	$1,124	$815
Additional options to the right of the demand function (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.111	$90	$0	$248	$0	$0	$642	$308	$482	$520	45.0	1,335.2	$1,124	$828
Land Fallow	San Joaquin	Range 1	12	$224	1	1	10%	0.164	$90	$25	$248	$0	$0	$646	$308	$482	$520	1.6	1,337.0	$1,128	$828
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$654	$309	$482	$520	1.2	1,338.2	$1,136	$829
Land Fallow	Sacramento	Range 2	26	$187	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$656	$309	$482	$520	3.3	1,341.5	$1,138	$829
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$658	$310	$482	$520	3.8	1,345.3	$1,140	$830
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$321	$482	$520	39.0	1,384.3	$1,162	$841
Land Fallow	Sacramento	Range 4	26	$205	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$682	$322	$482	$520	3.3	1,387.6	$1,164	$842
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$687	$323	$482	$520	3.8	1,391.3	$1,169	$843
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$695	$323	$482	$520	3.0	1,394.3	$1,177	$843
Land Fallow	San Joaquin	Range 2	12	$279	1	1	10%	0.164	$90	$25	$248	$0	$0	$706	$324	$482	$520	1.8	1,396.1	$1,188	$844
Land Fallow	Sacramento	Range 7	26	$228	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$713	$325	$482	$520	3.3	1,399.4	$1,195	$845
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$718	$326	$482	$520	3.8	1,403.2	$1,200	$846
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$326	$482	$520	1.2	1,404.4	$1,222	$846
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$327	$482	$520	3.0	1,407.3	$1,222	$847
Land Fallow	Sacramento	Range 11	26	$252	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$746	$328	$482	$520	3.3	1,410.6	$1,228	$848
Land Fallow	Sacramento	Range 12	32	$256	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$751	$329	$482	$520	3.8	1,414.4	$1,233	$849
Land Fallow	San Joaquin	Range 3	12	$336	1	1	10%	0.164	$90	$25	$248	$0	$0	$769	$330	$482	$520	1.8	1,416.2	$1,251	$850
Land Fallow	Sacramento	Range 13	26	$275	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$777	$331	$482	$520	3.3	1,419.5	$1,259	$851
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$783	$332	$482	$520	3.8	1,423.3	$1,266	$852
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$788	$333	$482	$520	3.0	1,426.2	$1,270	$853
Land Fallow	Tulare	Range 1	67	$387	1	1	10%	0.164	$60	$25	$248	$0	$0	$792	$336	$482	$520	9.9	1,436.1	$1,274	$856
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$836	$337	$482	$520	3.0	1,439.1	$1,318	$857
Land Fallow	San Joaquin	Range 4	12	$406	1	1	10%	0.164	$90	$25	$248	$0	$0	$845	$338	$482	$520	1.8	1,440.9	$1,327	$858
Land Fallow	Tulare	Range 2	67	$438	1	1	10%	0.164	$60	$25	$248	$0	$0	$848	$341	$482	$520	9.9	1,450.7	$1,330	$861
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$365	$482	$520	70.0	1,520.7	$1,332	$885
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$392	$482	$520	85.0	1,605.7	$1,362	$912
Land Fallow	Sacramento	Range 17	10	$365	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$887	$392	$482	$520	1.2	1,606.9	$1,369	$912
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	10%	0.164	$60	$25	$248	$0	$0	$889	$393	$482	$520	0.7	1,607.7	$1,371	$913
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$896	$394	$482	$520	3.0	1,610.6	$1,378	$914
Land Fallow	San Joaquin	Range 5	21	$452	1	1	10%	0.164	$90	$25	$248	$0	$0	$897	$394	$482	$520	3.1	1,613.7	$1,379	$914
Land Fallow	Tulare	Range 3	67	$490	1	1	10%	0.164	$60	$25	$248	$0	$0	$905	$398	$482	$520	9.9	1,623.6	$1,387	$918
Land Fallow	Tulare	Range 4	36	$492	1	1	10%	0.164	$60	$25	$248	$0	$0	$906	$399	$482	$520	5.3	1,628.9	$1,390	$919
Land Fallow	San Joaquin	Range 6	12	$483	1	1	10%	0.164	$90	$25	$248	$0	$0	$930	$400	$482	$520	1.8	1,630.7	$1,412	$920
Land Fallow	Tulare	Range 5	36	$540	1	1	10%	0.164	$60	$25	$248	$0	$0	$951	$402	$482	$520	5.3	1,636.0	$1,433	$922
Land Fallow	Tulare	Range 6	67	$542	1	1	10%	0.164	$60	$25	$248	$0	$0	$962	$405	$482	$520	9.9	1,645.9	$1,444	$925
Land Fallow	San Joaquin	Range 7	21	$522	1	1	10%	0.164	$90	$25	$248	$0	$0	$973	$406	$482	$520	3.1	1,649.0	$1,455	$926
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$409	$482	$520	7.0	1,656.0	$1,487	$929
Land Fallow	Tulare	Range 7	36	$588	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,013	$411	$482	$520	5.3	1,661.3	$1,496	$931
Land Fallow	Tulare	Range 8	67	$594	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,019	$414	$482	$520	9.9	1,671.2	$1,501	$934
Land Fallow	Tulare	Range 9	19	$607	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,034	$415	$482	$520	2.8	1,674.0	$1,516	$935
Land Fallow	San Joaquin	Range 8	21	$590	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,048	$416	$482	$520	3.1	1,677.1	$1,530	$936
Land Fallow	Tulare	Range 10	36	$635	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,066	$418	$482	$520	5.3	1,682.4	$1,547	$938
Land Fallow	Tulare	Range 11	19	$648	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,079	$420	$482	$520	2.8	1,685.2	$1,561	$940
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,100	$420	$482	$520	1.2	1,686.4	$1,582	$940
Land Fallow	Tulare	Range 12	36	$663	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,118	$422	$482	$520	5.3	1,691.7	$1,600	$942
Land Fallow	Tulare	Range 13	19	$688	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,123	$423	$482	$520	2.8	1,694.5	$1,605	$943
Land Fallow	San Joaquin	Range 9	21	$659	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,124	$425	$482	$520	3.1	1,697.6	$1,606	$945
Land Fallow	San Joaquin	Range 10	13	$654	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,162	$425	$482	$520	1.9	1,699.5	$1,644	$945

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Table 46

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, NO CONJUNCTIVE USE SENSITIVITY ANALYSIS

SAN FRANCISCO BAY REGION

Option			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Measure	Q_S Quantity (TAF/year)	C_S Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Land Fallow	Tulare	Range 14	19	$730	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,169	$427	$482	$520	2.8	1,702.3	$1,651	$947
Land Fallow	San Joaquin	Range 11	21	$728	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,201	$428	$482	$520	3.1	1,705.4	$1,683	$948
Land Fallow	San Joaquin	Range 12	13	$734	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,206	$429	$482	$520	1.9	1,707.4	$1,688	$949
Land Fallow	Tulare	Range 15	19	$771	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,214	$430	$482	$520	2.8	1,710.2	$1,696	$950
Land Fallow	San Joaquin	Range 13	13	$775	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,252	$431	$482	$520	1.9	1,712.1	$1,734	$951
Land Fallow	San Joaquin	Range 14	13	$815	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,296	$432	$482	$520	1.9	1,714.0	$1,778	$952
Land Fallow	Sacramento	Range 20	10	$866	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,315	$433	$482	$520	1.2	1,715.2	$1,797	$953
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$875	1	1	10%	0.164	$90	$0	$248	$0	$0	$1,335	$456	$482	$520	45.6	1,760.9	$1,817	$976
Land Fallow	San Joaquin	Range 15	13	$856	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,341	$457	$482	$520	1.9	1,762.9	$1,823	$977
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,411	$458	$482	$520	0.7	1,763.6	$1,893	$978
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develop.	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$487	$482	$520	50.0	1,813.6	$2,012	$1,007
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$508	$482	$520	28.0	1,841.6	$2,362	$1,028
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	10%	0.164	$60	$25	$248	$0	$0	$2,016	$514	$482	$520	6.5	1,848.1	$2,496	$1,034
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	10%	0.164	$90	$25	$248	$0	$0	$2,049	$514	$482	$520	1.0	1,849.1	$2,531	$1,034
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	10%	0.16	$90	$25	$248	$0	$0	$2,482	$518	$482	$520	1.8	1,850.9	$2,944	$1,036

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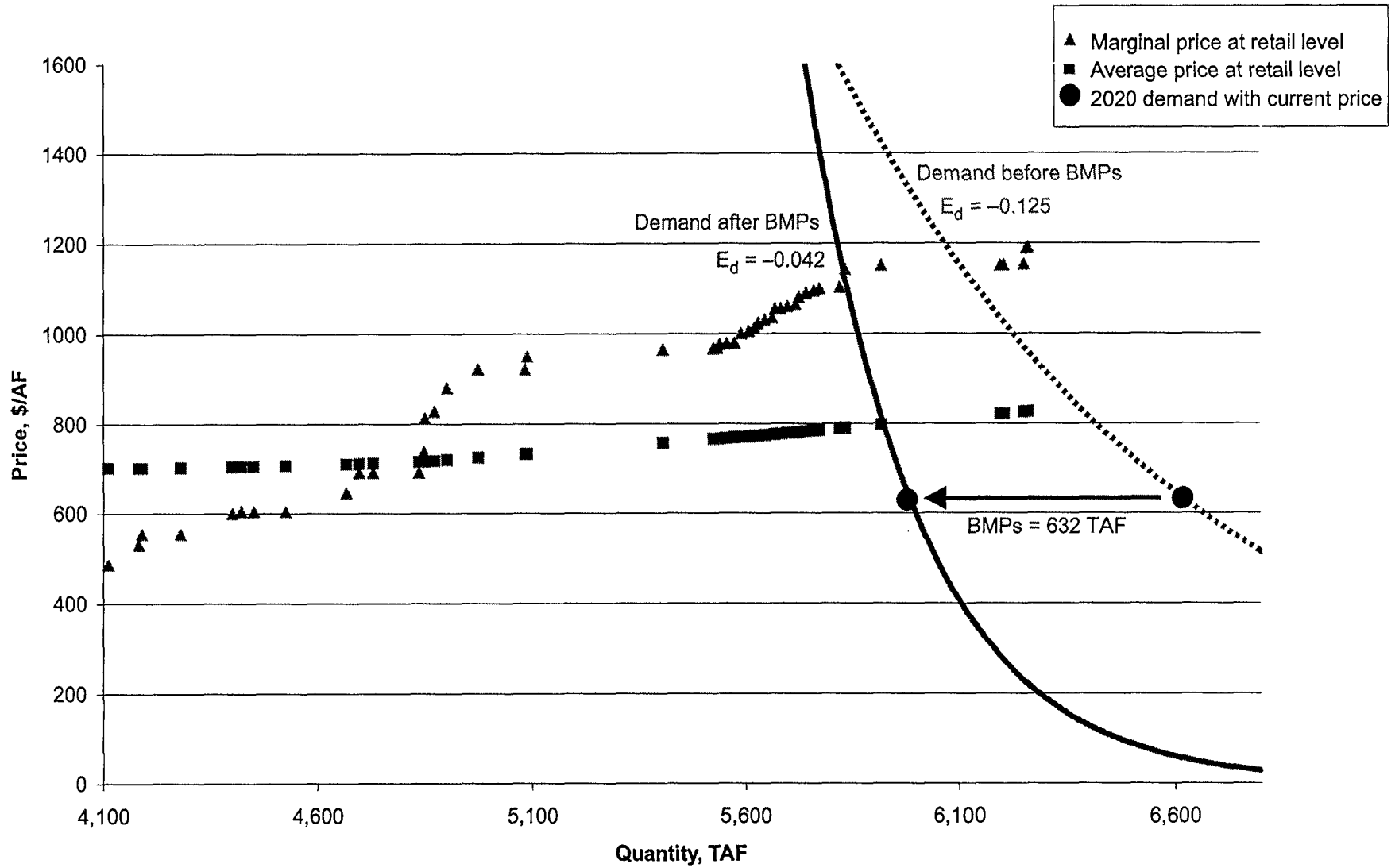

Chart 47
Screening Level Analysis
No Conjunctive Use Sensitivity Analysis
South Coast Region

Table 47

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, NO CONJUNCTIVE USE SENSITIVITY ANALYSIS
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_o Quantity (TAF/year)	At Source (dry condition) C_o Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_A MT Brine Loss Factor	F_A Share of New Supply Factor	C_c Transport Cost	C_T Transaction Fee, $/AF	C_q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_H Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$202	$325	$500	24.0	4111.0	$486	$702
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$202	$325	$500	70.9	4,181.8	$531	$702
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$202	$325	$500	7.6	4,189.5	$554	$702
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$202	$325	$500	91.6	4,281.0	$554	$702
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$204	$325	$500	119.9	4,400.9	$600	$704
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$205	$325	$500	20.7	4,421.6	$605	$705
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$205	$325	$500	28.3	4,450.0	$605	$705
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$207	$325	$500	74.1	4,524.1	$605	$707
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$210	$325	$500	141.7	4,665.8	$646	$710
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$211	$325	$500	29.4	4,695.2	$692	$711
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$212	$325	$500	32.7	4,727.9	$692	$712
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$216	$325	$500	109.0	4,836.9	$692	$716
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$216	$325	$500	10.9	4,847.8	$738	$716
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$248	$0	$0	$487	$216	$325	$500	2.4	4,850.2	$812	$716
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.344	$140	$0	$248	$0	$0	$503	$217	$325	$500	21.9	4,872.1	$828	$717
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$182	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$555	$219	$325	$500	29.5	4,901.6	$880	$719
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$225	$325	$500	73.0	4,974.6	$921	$725
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$233	$325	$500	109.0	5,083.6	$921	$733
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$626	$233	$325	$500	5.3	5,088.9	$951	$733
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$640	$257	$325	$500	317.0	5,405.9	$965	$757
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$266	$325	$500	119.9	5,525.8	$967	$766
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$643	$266	$325	$500	8.5	5,534.2	$968	$766
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$651	$267	$325	$500	5.6	5,539.9	$976	$767
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$652	$268	$325	$500	15.8	5,555.7	$977	$768
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$654	$269	$325	$500	18.0	5,573.7	$979	$769
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$676	$270	$325	$500	15.8	5,589.5	$1,001	$770
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$681	$271	$325	$500	18.0	5,607.5	$1,006	$771
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$688	$272	$325	$500	14.2	5,621.7	$1,013	$772
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$698	$273	$325	$500	8.5	5,630.1	$1,023	$773
Land Fallow	Sacramento	Range 7	28	$228	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$705	$274	$325	$500	15.8	5,645.9	$1,030	$774
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$710	$276	$325	$500	18.0	5,663.9	$1,035	$776
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$276	$325	$500	5.7	5,669.6	$1,055	$776
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$277	$325	$500	14.2	5,683.8	$1,055	$777
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$735	$278	$325	$500	15.8	5,699.6	$1,060	$778
Land Fallow	Sacramento	Range 12	32	$256	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$740	$280	$325	$500	18.0	5,717.6	$1,065	$780
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$756	$281	$325	$500	8.5	5,726.1	$1,081	$781
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$763	$282	$325	$500	15.8	5,741.9	$1,088	$782
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$768	$283	$325	$500	18.0	5,759.9	$1,093	$783
Land Fallow	Sacramento	Range 15	25	$283	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$774	$285	$325	$500	14.1	5,774.0	$1,099	$785
Land Fallow	Tulare	Range 1	67	$387	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$777	$289	$325	$500	47.2	5,821.2	$1,102	$789
Land Fallow	Sacramento	Range 16	25	$317	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$817	$290	$325	$500	14.2	5,835.4	$1,142	$790
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	0.229	$0	$0	$0	-$100	$0	$826	$297	$325	$500	82.4	5,917.7	$1,151	$797
Additional options to the right of the demand function (after BMPs)																					
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	0.771	$0	$0	$0	-$100	$0	$826	$321	$325	$500	277.3	6,195.1	$1,151	$821
Land Fallow	San Joaquin	Range 4	12	$406	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$826	$322	$325	$500	8.5	6,203.5	$1,151	$822
Land Fallow	Tulare	Range 2	67	$438	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$828	$326	$325	$500	47.2	6,250.7	$1,153	$826
Land Fallow	Sacramento	Range 17	10	$355	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$864	$326	$325	$500	5.6	6,256.3	$1,189	$826
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$866	$326	$325	$500	3.5	6,259.9	$1,191	$826
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 18	25	$362	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$873	$328	$325	$500	14.1	6,273.9	$1,198	$828
Land Fallow	San Joaquin	Range 5	21	$452	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$873	$329	$325	$500	14.8	6,288.7	$1,198	$829
Land Fallow	Tulare	Range 3	67	$490	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$881	$333	$325	$500	47.2	6,335.9	$1,206	$833
Land Fallow	Tulare	Range 4	36	$492	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$883	$335	$325	$500	25.4	6,361.3	$1,208	$835
Land Fallow	San Joaquin	Range 6	12	$483	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$904	$336	$325	$500	8.5	6,369.7	$1,229	$836
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$346	$325	$500	109.0	6,478.7	$1,242	$846
Land Fallow	Tulare	Range 5	36	$540	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$932	$348	$325	$500	25.4	6,504.1	$1,257	$848
Land Fallow	Tulare	Range 6	67	$542	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$933	$352	$325	$500	47.2	6,551.3	$1,258	$852
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$354	$325	$500	20.7	6,572.0	$1,265	$854
Land Fallow	San Joaquin	Range 7	21	$522	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$943	$355	$325	$500	14.8	6,586.8	$1,268	$855
Land Fallow	Tulare	Range 7	36	$588	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$980	$358	$325	$500	25.4	6,612.1	$1,305	$858
Land Fallow	Tulare	Range 8	67	$594	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$986	$362	$325	$500	47.2	6,659.3	$1,311	$862

D-013624

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Table 47

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, NO CONJUNCTIVE USE SENSITIVITY ANALYSIS
SOUTH COAST REGION

			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Option Measure	Q_o Quantity (TAF/year)	C_o Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Land Fallow	Tulare	Range 9	19	$607	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$999	$364	$325	$500	13.4	6,672.7	$1,324	$864
Land Fallow	San Joaquin	Range 8	21	$590	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,012	$365	$325	$500	14.8	6,687.5	$1,337	$865
Land Fallow	Tulare	Range 10	36	$635	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,027	$367	$325	$500	25.4	6,712.9	$1,352	$867
Land Fallow	Tulare	Range 11	19	$648	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,041	$369	$325	$500	13.4	6,726.3	$1,366	$869
Land Fallow	Sacramento	Range 19	10	$510	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,060	$369	$325	$500	5.6	6,731.9	$1,385	$869
Land Fallow	Tulare	Range 12	36	$683	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,076	$372	$325	$500	25.4	6,757.2	$1,401	$872
Land Fallow	Tulare	Range 13	19	$688	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,081	$373	$325	$500	13.4	6,770.6	$1,406	$873
Land Fallow	San Joaquin	Range 9	21	$659	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,082	$375	$325	$500	14.8	6,785.4	$1,407	$875
Land Fallow	San Joaquin	Range 10	13	$694	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,117	$376	$325	$500	9.2	6,794.6	$1,442	$876
Land Fallow	Tulare	Range 14	19	$730	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,123	$377	$325	$500	13.4	6,808.0	$1,448	$877
Land Fallow	San Joaquin	Range 11	21	$728	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,152	$379	$325	$500	14.8	6,822.7	$1,477	$879
Land Fallow	San Joaquin	Range 12	13	$734	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,157	$380	$325	$500	9.2	6,831.9	$1,482	$880
Land Fallow	Tulare	Range 15	19	$771	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,165	$382	$325	$500	13.4	6,845.3	$1,490	$882
Land Fallow	San Joaquin	Range 13	13	$775	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,199	$383	$325	$500	9.2	6,854.4	$1,524	$883
Land Fallow	San Joaquin	Range 14	13	$815	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,239	$384	$325	$500	9.2	6,863.6	$1,564	$884
Land Fallow	Sacramento	Range 20	10	$666	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,257	$385	$325	$500	5.6	6,869.2	$1,582	$885
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$1,276	$412	$325	$500	218.4	7,087.6	$1,601	$912
Land Fallow	San Joaquin	Range 15	13	$856	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,281	$413	$325	$500	9.2	7,096.7	$1,606	$913
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$416	$325	$500	20.7	7,117.5	$1,609	$916
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$429	$325	$500	109.0	7,226.5	$1,609	$929
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$482	$325	$500	474.2	7,700.6	$1,609	$982
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,345	$482	$325	$500	3.5	7,704.1	$1,670	$982
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,650	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$505	$325	$500	195.1	7,899.2	$1,747	$1,005
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$519	$325	$500	88.3	7,987.5	$2,068	$1,019
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,900	$524	$325	$500	31.0	8,018.5	$2,225	$1,024
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,931	$525	$325	$500	4.9	8,023.4	$2,256	$1,025
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$2,309	$527	$325	$500	8.5	8,031.9	$2,634	$1,027

D-013625

D—013625

D-013626

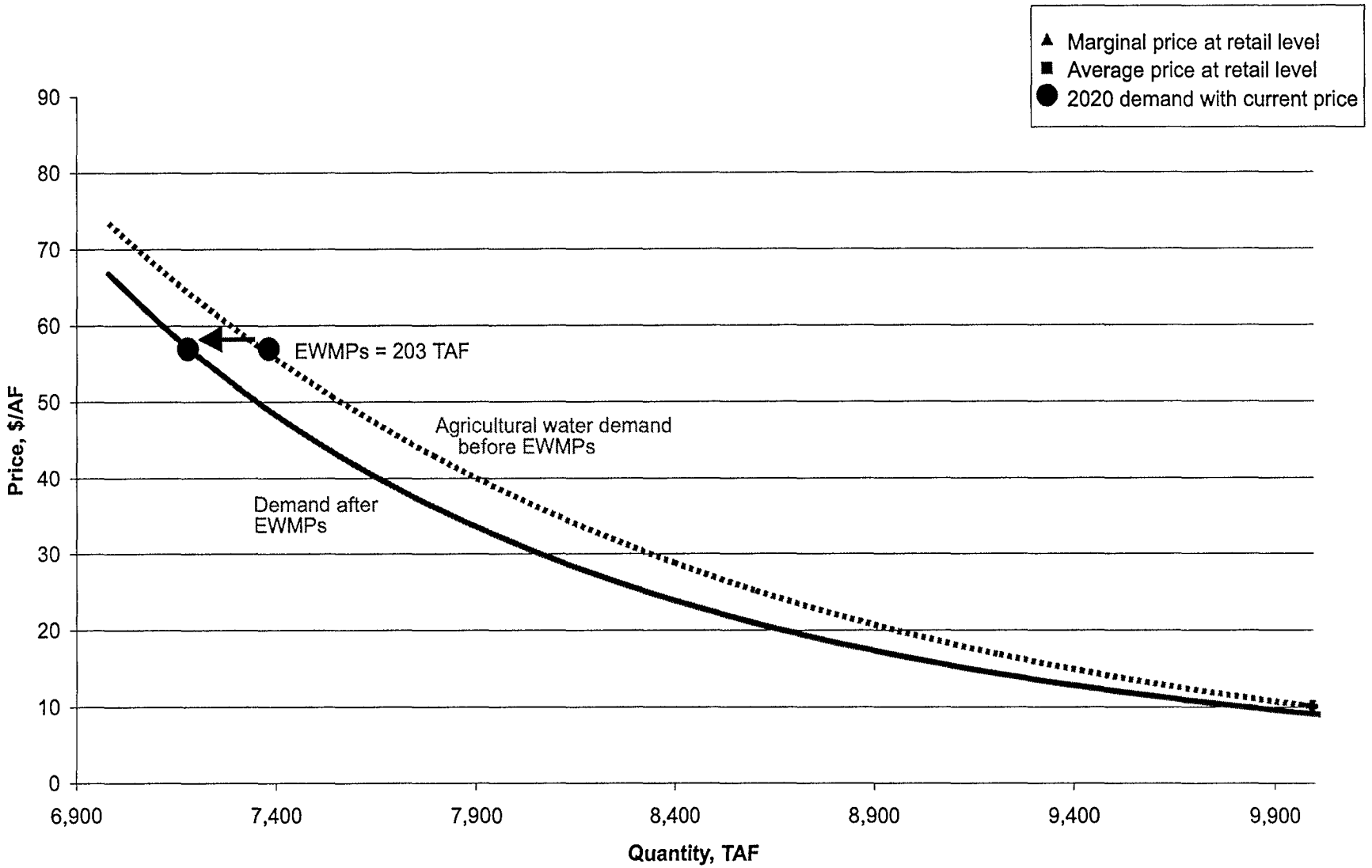

Chart 48

Screening Level Analysis
No Conjunctive Use Sensitivity Analysis
Sacramento River Region

D—013626

Table 48

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, NO CONJUNCTIVE USE SENSITIVITY ANALYSIS
SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

Options screened to meet demand

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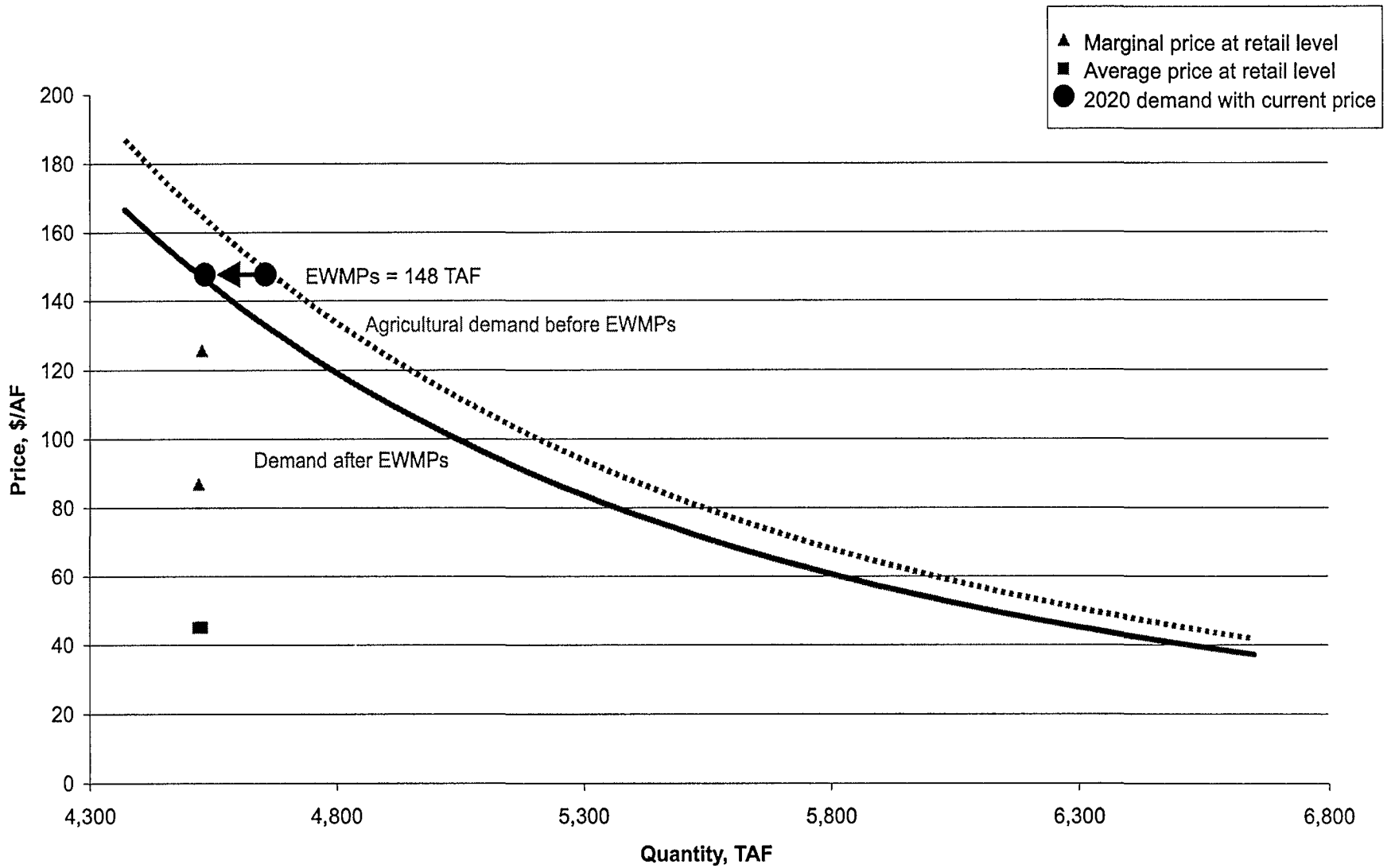

Chart 49
Screening Level Analysis
No Conjunctive Use Sensitivity Analysis
San Joaquin River Region

D-013628

Table 49

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, NO CONJUNCTIVE USE SENSITIVITY ANALYSIS
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	South Delta Improvements	65	$110	1.15	1	0.106	$30	$0	7.9	$126	4,527	$126	$45.15

D-013629

D-013629

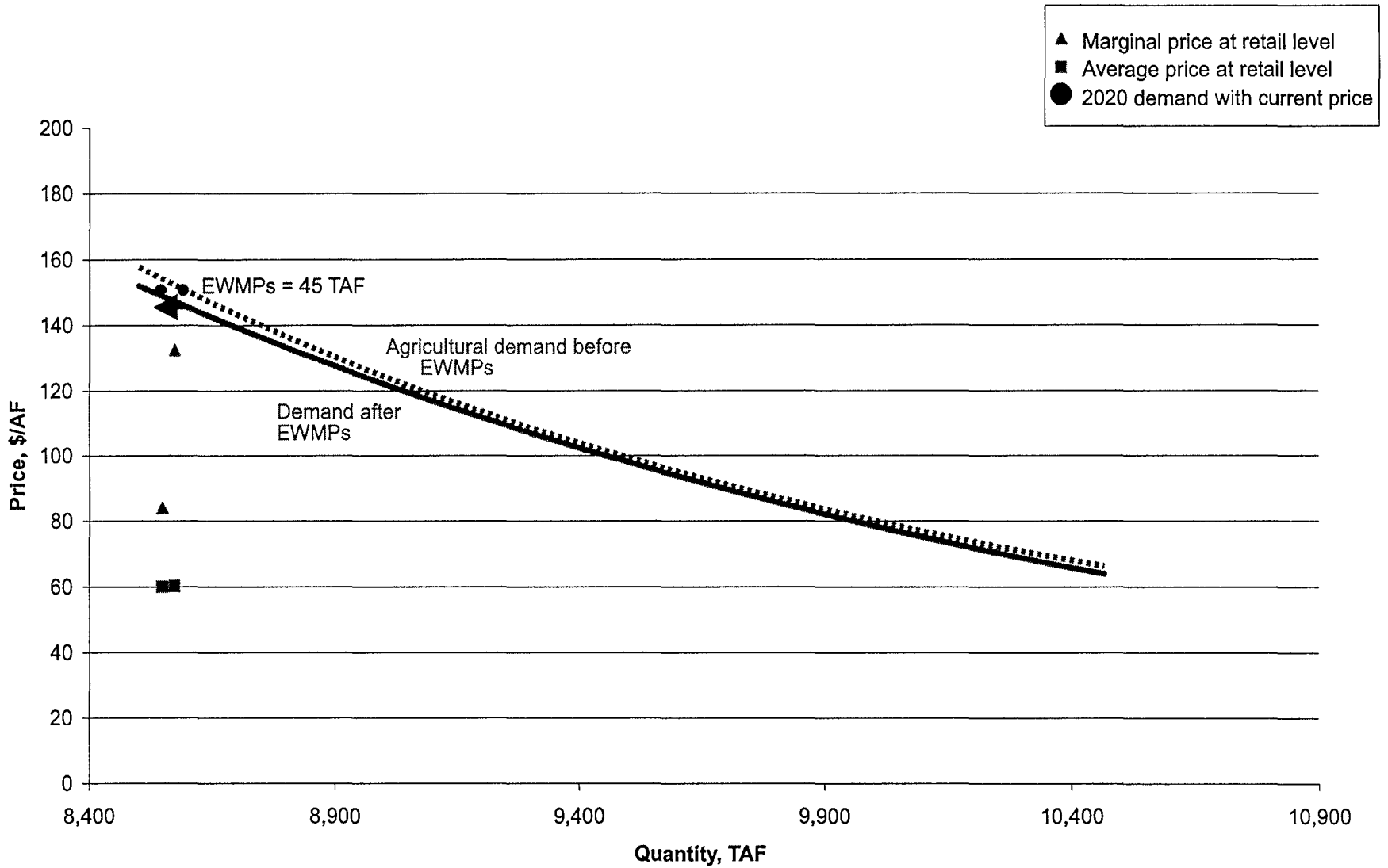

Chart 50
Screening Level Analysis
No Conjunctive Use Sensitivity Analysis
Tulare Lake Region

D-013631

Table 50

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, NO CONJUNCTIVE USE SENSITIVITY ANALYSIS
TULARE LAKE REGION

Option			At Source (dry condition)							At Destination				
										At Farm			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,575	$132	$60.22

D—013631

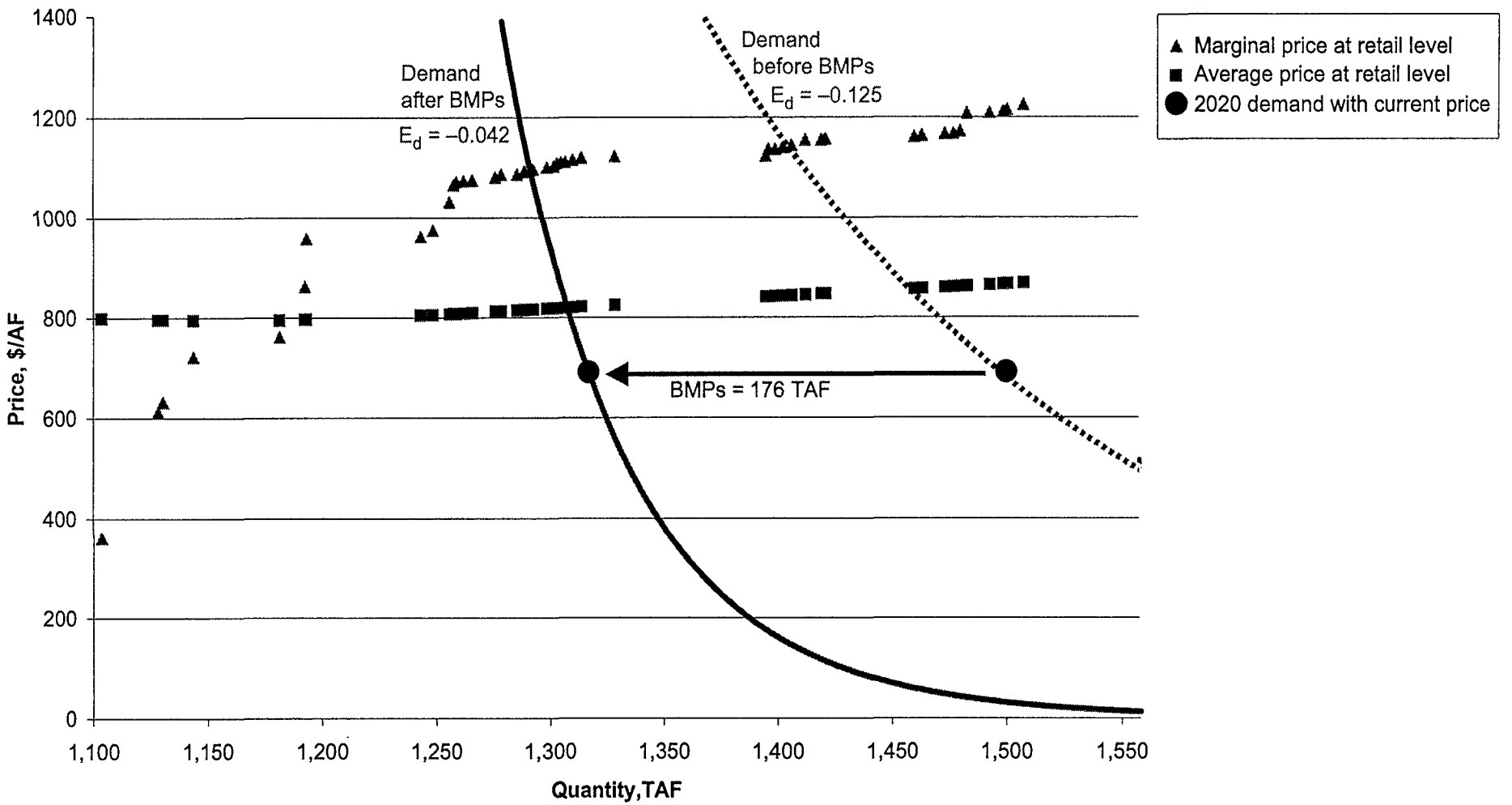

Chart 51
Screening Level Analysis
Land Fallowing Cost Sensitivity Analysis
San Francisco Bay Region

D-013633

Table 51

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LAND FALLOWING COST SENSITIVITY ANALYSIS

SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_S MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive P_M Marginal Unit Cost $/AF	Retail Cost Additive P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination, Retail Price Using: P_D Marginal Cost at Retail	At Destination, Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$279	$482	$520	25.0	1103.0	$362	$799
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$276	$482	$520	25.0	1,128.0	$612	$796
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$275	$482	$520	2.0	1,130.0	$632	$795
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$80	$0	$240	$275	$482	$520	13.0	1,143.0	$722	$795
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$275	$482	$520	38.0	1,181.0	$762	$796
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$276	$482	$520	11.0	1,192.0	$862	$796
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	10%	0.094	$60	$25	$248	$0	$0	$476	$276	$482	$520	0.6	1,192.6	$958	$796
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$284	$482	$520	50.0	1,242.6	$962	$804
Other	Delta	South Delta Improvements	65	$110	1	1	10%	0.094	$90	$0	$248	$0	$0	$493	$285	$482	$520	5.5	1,248.1	$975	$805
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1	1	10%	0.164	$90	$0	$248	$0	$0	$550	$287	$482	$520	7.4	1,255.5	$1,032	$807
Land Fallow	San Joaquin	Range 1	12	$168	1	1	10%	0.164	$90	$25	$248	$0	$0	$584	$287	$482	$520	1.8	1,257.2	$1,066	$807
Land Fallow	Sacramento	Range 1	10	$139	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$591	$288	$482	$520	1.2	1,258.4	$1,073	$808
Land Fallow	Sacramento	Range 2	28	$140	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$592	$288	$482	$520	3.3	1,261.7	$1,074	$808
Land Fallow	Sacramento	Range 3	32	$141	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$593	$289	$482	$520	3.8	1,265.5	$1,075	$809
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$292	$482	$520	10.0	1,275.5	$1,082	$812
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	10%	0.094	$90	$25	$248	$0	$0	$606	$292	$482	$520	2.7	1,278.2	$1,088	$812
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$606	$294	$482	$520	7.1	1,285.3	$1,088	$814
Land Fallow	Sacramento	Range 4	28	$154	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$611	$295	$482	$520	3.3	1,288.6	$1,093	$815
Land Fallow	Sacramento	Range 5	32	$157	1	0.8	10%	0.126	$90	$25	$248	$0	$0	$615	$296	$482	$520	2.9	1,291.5	$1,097	$816
Additional options to the right of the demand function (after BMPs)																					
Land Fallow	Sacramento	Range 5	32	$157	1	0.8	10%	0.038	$90	$25	$248	$0	$0	$615	$296	$482	$520	0.9	1,292.4	$1,097	$816
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	10%	0.164	$90	$25	$248	$0	$0	$619	$297	$482	$520	5.9	1,298.3	$1,101	$817
Land Fallow	Sacramento	Range 6	25	$161	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$621	$298	$482	$520	3.0	1,301.3	$1,103	$818
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	10%	0.164	$90	$0	$248	$0	$0	$627	$298	$482	$520	1.3	1,302.6	$1,109	$818
Land Fallow	San Joaquin	Range 2	12	$209	1	1	10%	0.164	$90	$25	$248	$0	$0	$629	$299	$482	$520	1.8	1,304.4	$1,111	$819
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$299	$482	$520	2.0	1,306.4	$1,112	$819
Land Fallow	Sacramento	Range 7	28	$171	1	0.8	10%	0.05	$90	$25	$248	$0	$0	$635	$300	$482	$520	1.0	1,307.4	$1,117	$820
Land Fallow	Sacramento	Range 7	28	$171	1	0.8	10%	0.114	$90	$25	$248	$0	$0	$635	$300	$482	$520	2.3	1,309.7	$1,117	$820
Land Fallow	Sacramento	Range 8	32	$174	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$639	$301	$482	$520	3.8	1,313.4	$1,121	$821
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.164	$60	$25	$248	$0	$0	$641	$305	$482	$520	14.8	1,328.2	$1,123	$825
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1	1	10%	0.164	$90	$0	$248	$0	$0	$642	$321	$482	$520	66.4	1,394.6	$1,124	$841
Land Fallow	Sacramento	Range 9	10	$186	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$655	$321	$482	$520	1.2	1,395.8	$1,137	$841
Land Fallow	Sacramento	Range 10	25	$186	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$655	$322	$482	$520	3.0	1,398.8	$1,137	$842
Land Fallow	Sacramento	Range 11	28	$189	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$659	$323	$482	$520	3.3	1,402.1	$1,141	$843
Land Fallow	Sacramento	Range 12	32	$192	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$663	$324	$482	$520	3.8	1,405.9	$1,145	$844
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	10%	0.164	$90	$25	$248	$0	$0	$674	$325	$482	$520	5.9	1,411.8	$1,156	$845
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$674	$327	$482	$520	7.1	1,418.9	$1,156	$847
Land Fallow	San Joaquin	Range 3	12	$252	1	1	10%	0.164	$90	$25	$248	$0	$0	$677	$327	$482	$520	1.8	1,420.6	$1,159	$847
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcc	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$337	$482	$520	39.0	1,459.6	$1,162	$857
Land Fallow	Sacramento	Range 13	28	$206	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$683	$338	$482	$520	3.3	1,462.9	$1,165	$858
Land Fallow	Tulare	Range 1	67	$290	1	1	10%	0.164	$60	$25	$248	$0	$0	$685	$340	$482	$520	9.9	1,472.8	$1,167	$860
Land Fallow	Sacramento	Range 14	32	$209	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$687	$341	$482	$520	3.8	1,476.6	$1,169	$861
Land Fallow	Sacramento	Range 15	25	$212	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$691	$342	$482	$520	3.0	1,479.6	$1,173	$862
Land Fallow	Sacramento	Range 16	25	$238	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$727	$342	$482	$520	3.0	1,482.5	$1,209	$862
Land Fallow	Tulare	Range 2	67	$328	1	1	10%	0.164	$60	$25	$248	$0	$0	$727	$345	$482	$520	9.9	1,492.4	$1,209	$865
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	10%	0.164	$90	$25	$248	$0	$0	$729	$346	$482	$520	5.9	1,498.3	$1,211	$866
Land Fallow	San Joaquin	Range 4	12	$304	1	1	10%	0.164	$90	$25	$248	$0	$0	$734	$347	$482	$520	1.8	1,500.1	$1,216	$867
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$743	$349	$482	$520	7.1	1,507.2	$1,225	$869
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 17	10	$266	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$765	$349	$482	$520	1.2	1,508.4	$1,247	$869
Land Fallow	Tulare	Range 3	67	$367	1	1	10%	0.164	$60	$25	$248	$0	$0	$770	$352	$482	$520	9.9	1,518.3	$1,252	$872
Land Fallow	Sacramento	Range 18	25	$271	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$772	$353	$482	$520	3.0	1,521.2	$1,254	$873
Land Fallow	San Joaquin	Range 5	21	$339	1	1	10%	0.164	$90	$25	$248	$0	$0	$772	$353	$482	$520	3.1	1,524.3	$1,254	$873
Land Fallow	Tulare	Range 4	36	$369	1	1	10%	0.164	$60	$25	$248	$0	$0	$772	$355	$482	$520	5.3	1,529.6	$1,254	$875
Land Fallow	San Joaquin	Range 6	12	$362	1	1	10%	0.164	$90	$25	$248	$0	$0	$798	$356	$482	$520	1.8	1,531.4	$1,280	$875
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$812	$358	$482	$520	7.1	1,538.5	$1,294	$878
Land Fallow	Tulare	Range 5	36	$405	1	1	10%	0.164	$60	$25	$248	$0	$0	$812	$359	$482	$520	5.3	1,543.8	$1,294	$879
Land Fallow	Tulare	Range 6	67	$406	1	1	10%	0.164	$60	$25	$248	$0	$0	$813	$362	$482	$520	9.9	1,553.7	$1,295	$882
Land Fallow	San Joaquin	Range 7	21	$391	1	1	10%	0.164	$90	$25	$248	$0	$0	$830	$363	$482	$520	3.1	1,556.8	$1,312	$883
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$384	$482	$520	70.0	1,626.8	$1,332	$904
Land Fallow	Tulare	Range 7	36	$441	1	1	10%	0.164	$60	$25	$248	$0	$0	$852	$385	$482	$520	5.3	1,632.1	$1,334	$906
Land Fallow	Tulare	Range 8	67	$445	1	1	10%	0.164	$60	$25	$248	$0	$0	$856	$388	$482	$520	9.9	1,642.0	$1,338	$908
Land Fallow	Tulare	Range 9	19	$455	1	1	10%	0.164	$60	$25	$248	$0	$0	$867	$389	$482	$520	2.8	1,644.8	$1,349	$909
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$413	$482	$520	85.0	1,729.8	$1,362	$933
Land Fallow	San Joaquin	Range 8	21	$442	1	1	10%	0.164	$90	$25	$248	$0	$0	$886	$414	$482	$520	3.1	1,732.9	$1,368	$934

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Table 51

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LAND FALLOWING COST SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Option Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	10%	0.164	$80	$25	$248	$0	$0	$889	$414	$482	$520	0.7	1,733.6	$1,371	$934
Land Fallow	Tulare	Range 10	36	$476	1	1	10%	0.164	$80	$25	$248	$0	$0	$890	$416	$482	$520	5.3	1,738.9	$1,372	$936
Land Fallow	Tulare	Range 11	19	$486	1	1	10%	0.164	$80	$25	$248	$0	$0	$901	$416	$482	$520	2.8	1,741.7	$1,383	$936
Land Fallow	Sacramento	Range 19	10	$382	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$925	$417	$482	$520	1.2	1,742.9	$1,407	$937
Land Fallow	Tulare	Range 12	36	$512	1	1	10%	0.164	$80	$25	$248	$0	$0	$930	$418	$482	$520	5.3	1,748.2	$1,412	$938
Land Fallow	Tulare	Range 13	19	$516	1	1	10%	0.164	$80	$25	$248	$0	$0	$934	$419	$482	$520	2.8	1,751.0	$1,416	$939
Land Fallow	San Joaquin	Range 9	21	$494	1	1	10%	0.164	$90	$25	$248	$0	$0	$943	$420	$482	$520	3.1	1,754.1	$1,425	$940
Land Fallow	Tulare	Range 14	19	$547	1	1	10%	0.164	$80	$25	$248	$0	$0	$968	$421	$482	$520	2.8	1,756.9	$1,450	$941
Land Fallow	San Joaquin	Range 10	13	$520	1	1	10%	0.164	$90	$25	$248	$0	$0	$972	$422	$482	$520	1.9	1,758.9	$1,454	$942
Land Fallow	San Joaquin	Range 11	21	$546	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,000	$423	$482	$520	3.1	1,762.0	$1,482	$943
Land Fallow	Tulare	Range 15	19	$578	1	1	10%	0.164	$80	$25	$248	$0	$0	$1,002	$424	$482	$520	2.8	1,764.8	$1,484	$944
Land Fallow	San Joaquin	Range 12	13	$550	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,005	$424	$482	$520	1.9	1,766.7	$1,487	$944
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$426	$482	$520	7.0	1,773.7	$1,487	$946
Land Fallow	San Joaquin	Range 13	13	$581	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,039	$427	$482	$520	1.9	1,775.6	$1,521	$947
Land Fallow	San Joaquin	Range 14	13	$611	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,072	$428	$482	$520	1.9	1,777.5	$1,554	$948
Land Fallow	Sacramento	Range 20	10	$499	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,086	$428	$482	$520	1.2	1,778.7	$1,568	$948
Land Fallow	San Joaquin	Range 16	13	$642	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,106	$429	$482	$520	1.9	1,780.6	$1,588	$949
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1	1	10%	0.164	$90	$0	$248	$0	$0	$1,335	$452	$482	$520	45.8	1,826.4	$1,817	$972
Ag WUE	Tulare	Increase efficiency, Range 3	5	$960	1	1	10%	0.164	$80	$25	$248	$0	$0	$1,411	$452	$482	$520	0.7	1,827.1	$1,893	$972
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develo	50	$1,850	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$481	$482	$520	50.0	1,877.1	$2,012	$1,001
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$501	$482	$520	28.0	1,905.1	$2,362	$1,021
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	10%	0.164	$80	$25	$248	$0	$0	$2,016	$507	$482	$520	6.5	1,911.6	$2,496	$1,027
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	10%	0.164	$90	$25	$248	$0	$0	$2,049	$507	$482	$520	1.0	1,912.6	$2,531	$1,027
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	10%	0.16	$90	$25	$248	$0	$0	$2,482	$509	$482	$520	1.8	1,914.4	$2,944	$1,029

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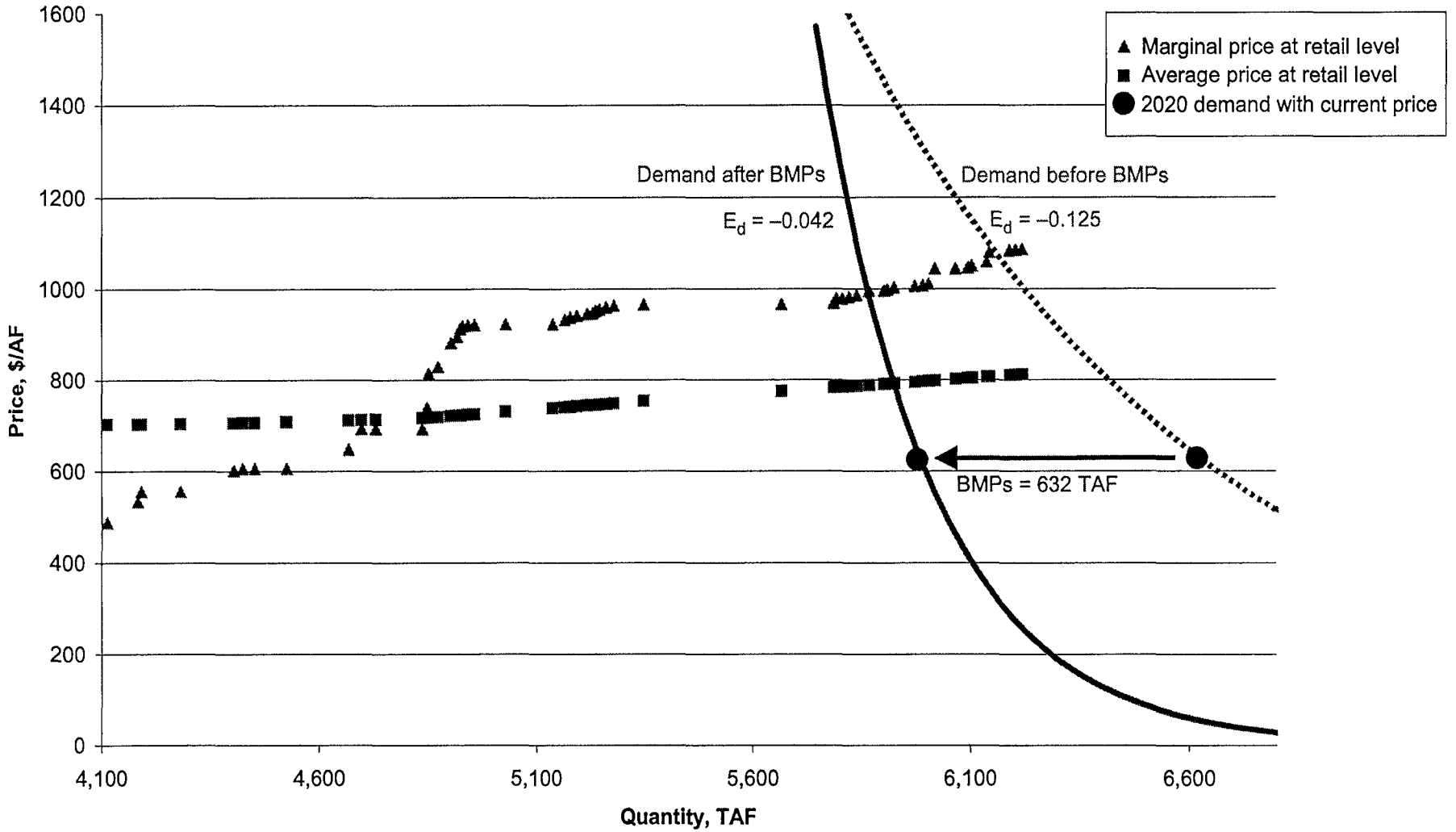

Chart 52
Screening Level Analysis
Land Fallowing Cost Sensitivity Analysis
South Coast Region

Table 52
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LAND FALLOWING COST SENSITIVITY ANALYSIS
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive P_M Marginal Unit Cost $/AF	Retail Cost Additive P_M Average Unit Cost $/AF	At Destination Q_D Retail Quantity (TAF/year)	At Destination Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$202	$325	$500	24.0	4111.0	$486	$702
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$202	$325	$500	70.9	4,181.8	$531	$702
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$202	$325	$500	7.6	4,189.5	$554	$702
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$202	$325	$500	91.6	4,281.0	$554	$702
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$204	$325	$500	119.9	4,400.9	$600	$704
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$205	$325	$500	20.7	4,421.6	$605	$705
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$205	$325	$500	28.3	4,450.0	$605	$705
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$207	$325	$500	74.1	4,524.1	$605	$707
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$210	$325	$500	141.7	4,665.8	$646	$710
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$211	$325	$500	29.4	4,695.2	$692	$711
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$212	$325	$500	32.7	4,727.9	$692	$712
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$216	$325	$500	109.0	4,836.9	$692	$716
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$216	$325	$500	10.9	4,847.8	$738	$716
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$248	$0	$0	$487	$216	$325	$500	2.4	4,850.2	$812	$716
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.344	$140	$0	$248	$0	$0	$503	$217	$325	$500	21.9	4,872.1	$828	$717
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.09	1	10%	0.801	$140	$0	$248	$0	$0	$555	$219	$325	$500	29.5	4,901.6	$880	$719
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.344	$140	$25	$248	$0	$0	$568	$220	$325	$500	13.5	4,915.1	$893	$720
Land Fallow	San Joaquin	Range 1	12	$168	1.09	1	10%	0.801	$140	$25	$248	$0	$0	$586	$221	$325	$500	7.1	4,922.2	$911	$721
Land Fallow	Sacramento	Range 1	10	$139	1.09	0.8	10%	0.801	$140	$25	$248	$0	$0	$592	$221	$325	$500	4.7	4,926.9	$917	$721
Land Fallow	Sacramento	Range 2	28	$140	1.09	0.8	10%	0.801	$140	$25	$248	$0	$0	$593	$222	$325	$500	13.2	4,940.1	$918	$722
Land Fallow	Sacramento	Range 3	32	$141	1.09	0.8	10%	0.801	$140	$25	$248	$0	$0	$595	$223	$325	$500	15.1	4,955.2	$920	$723
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$229	$325	$500	73.0	5,028.2	$921	$729
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$237	$325	$500	109.0	5,137.2	$921	$737
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	10%	0.801	$140	$25	$248	$0	$0	$606	$239	$325	$500	28.3	5,165.5	$931	$739
Land Fallow	Sacramento	Range 4	28	$154	1.09	0.8	10%	0.801	$140	$25	$248	$0	$0	$611	$240	$325	$500	13.2	5,178.7	$936	$740
Land Fallow	Sacramento	Range 5	32	$157	1.09	0.8	10%	0.801	$140	$25	$248	$0	$0	$615	$241	$325	$500	15.1	5,193.8	$940	$741
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$619	$243	$325	$500	28.2	5,222.0	$944	$743
Land Fallow	Sacramento	Range 6	25	$161	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$620	$244	$325	$500	14.2	5,236.2	$945	$744
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$626	$244	$325	$500	6.3	5,242.5	$951	$744
Land Fallow	San Joaquin	Range 2	12	$209	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$628	$245	$325	$500	8.5	5,251.0	$953	$745
Land Fallow	Sacramento	Range 7	28	$171	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$633	$246	$325	$500	15.8	5,266.7	$958	$746
Land Fallow	Sacramento	Range 8	32	$174	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$636	$247	$325	$500	18.0	5,284.8	$961	$747
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$639	$252	$325	$500	70.4	5,355.2	$964	$752
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$640	$274	$325	$500	317.0	5,672.2	$965	$774
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$282	$325	$500	119.9	5,792.1	$967	$782
Land Fallow	Sacramento	Range 9	10	$186	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$652	$282	$325	$500	5.7	5,797.8	$977	$782
Land Fallow	Sacramento	Range 10	25	$186	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$652	$283	$325	$500	14.2	5,812.0	$977	$783
Land Fallow	Sacramento	Range 11	28	$189	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$655	$284	$325	$500	15.8	5,827.7	$980	$784
Land Fallow	Sacramento	Range 12	32	$192	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$659	$285	$325	$500	18.0	5,845.8	$984	$785
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.45	$140	$25	$248	$0	$0	$669	$286	$325	$500	17.7	5,863.4	$994	$786
Additional options to the right of the demand function (after BMPs)																					
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.268	$140	$25	$248	$0	$0	$669	$287	$325	$500	10.5	5,873.9	$994	$787
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$669	$289	$325	$500	33.8	5,907.7	$994	$789
Land Fallow	San Joaquin	Range 3	12	$252	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$671	$290	$325	$500	8.5	5,916.2	$996	$790
Land Fallow	Sacramento	Range 13	28	$206	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$677	$291	$325	$500	15.8	5,932.0	$1,002	$791
Land Fallow	Tulare	Range 1	67	$290	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$679	$294	$325	$500	47.2	5,979.2	$1,004	$794
Land Fallow	Sacramento	Range 14	32	$209	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$681	$295	$325	$500	18.0	5,997.2	$1,006	$795
Land Fallow	Sacramento	Range 15	25	$212	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$684	$296	$325	$500	14.1	6,011.3	$1,009	$796
Land Fallow	Sacramento	Range 16	25	$236	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$717	$297	$325	$500	14.2	6,025.5	$1,042	$797
Land Fallow	Tulare	Range 2	67	$328	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$718	$300	$325	$500	47.2	6,072.7	$1,043	$800
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$720	$302	$325	$500	28.2	6,100.8	$1,045	$802
Land Fallow	San Joaquin	Range 4	12	$304	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$724	$303	$325	$500	8.5	6,109.3	$1,049	$803
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$732	$305	$325	$500	33.8	6,143.1	$1,067	$805
Land Fallow	Sacramento	Range 17	10	$266	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$753	$305	$325	$500	5.6	6,148.7	$1,078	$805
Land Fallow	Tulare	Range 3	67	$367	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$757	$309	$325	$500	47.2	6,195.9	$1,082	$809
Land Fallow	Sacramento	Range 18	25	$271	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$759	$310	$325	$500	14.1	6,210.0	$1,084	$810
Land Fallow	San Joaquin	Range 5	21	$339	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$759	$311	$325	$500	14.8	6,224.8	$1,084	$811
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Tulare	Range 4	36	$369	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$759	$313	$325	$500	25.4	6,250.2	$1,084	$813
Land Fallow	San Joaquin	Range 6	12	$362	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$782	$313	$325	$500	8.5	6,258.6	$1,107	$813
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$795	$316	$325	$500	33.8	6,292.4	$1,120	$816
Land Fallow	Tulare	Range 5	36	$406	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$795	$318	$325	$500	25.4	6,317.8	$1,120	$818
Land Fallow	Tulare	Range 6	67	$406	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$796	$322	$325	$500	47.2	6,365.0	$1,121	$822
Land Fallow	San Joaquin	Range 7	21	$391	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$812	$323	$325	$500	14.8	6,379.8	$1,137	$823
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$350	$325	$500	359.7	6,739.5	$1,151	$850
Land Fallow	Tulare	Range 7	36	$441	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$832	$351	$325	$500	25.4	6,764.8	$1,157	$851
Land Fallow	Tulare	Range 8	67	$445	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$836	$355	$325	$500	47.2	6,812.0	$1,161	$855

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D-013636

Table 52

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LAND FALLOWING COST SENSITIVITY ANALYSIS
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Land Fallow	Tulare	Range 9	19	$455	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$846	$356	$325	$500	13.4	6,825.4	$1,171	$856
Land Fallow	San Joaquin	Range 8	21	$442	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$863	$357	$325	$500	14.8	6,840.2	$1,188	$857
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$866	$357	$325	$500	3.5	6,843.7	$1,191	$857
Land Fallow	Tulare	Range 10	36	$476	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$867	$359	$325	$500	25.4	6,869.1	$1,192	$859
Land Fallow	Tulare	Range 11	19	$486	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$877	$360	$325	$500	13.4	6,882.4	$1,202	$860
Land Fallow	Sacramento	Range 19	10	$362	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$899	$360	$325	$500	5.6	6,888.1	$1,224	$860
Land Fallow	Tulare	Range 12	36	$512	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$903	$362	$325	$500	25.4	6,913.4	$1,228	$862
Land Fallow	Tulare	Range 13	19	$518	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$908	$363	$325	$500	13.4	6,926.8	$1,233	$863
Land Fallow	San Joaquin	Range 9	21	$464	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$916	$365	$325	$500	14.8	6,941.6	$1,241	$865
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$373	$325	$500	109.0	7,050.6	$1,242	$873
Land Fallow	Tulare	Range 14	19	$547	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$939	$374	$325	$500	13.4	7,064.0	$1,264	$874
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$376	$325	$500	20.7	7,084.7	$1,265	$876
Land Fallow	San Joaquin	Range 10	13	$520	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$942	$377	$325	$500	9.2	7,093.9	$1,267	$877
Land Fallow	San Joaquin	Range 11	21	$546	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$968	$378	$325	$500	14.8	7,108.7	$1,293	$878
Land Fallow	Tulare	Range 15	19	$578	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$970	$379	$325	$500	13.4	7,122.0	$1,295	$879
Land Fallow	San Joaquin	Range 12	13	$550	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$972	$380	$325	$500	9.2	7,131.2	$1,297	$880
Land Fallow	San Joaquin	Range 13	13	$581	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,003	$380	$325	$500	9.2	7,140.3	$1,328	$880
Land Fallow	San Joaquin	Range 14	13	$611	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,034	$381	$325	$500	9.2	7,149.5	$1,359	$881
Land Fallow	Sacramento	Range 20	10	$499	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,047	$382	$325	$500	5.6	7,155.1	$1,372	$882
Land Fallow	San Joaquin	Range 15	13	$642	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,065	$383	$325	$500	9.2	7,164.3	$1,390	$883
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$1,276	$409	$325	$500	218.4	7,382.6	$1,601	$909
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$412	$325	$500	20.7	7,403.4	$1,609	$912
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$424	$325	$500	109.0	7,512.4	$1,609	$924
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$475	$325	$500	474.2	7,986.5	$1,609	$975
Ag WUE	Tulare	Increase efficiency, Range 3	5	$960	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,345	$476	$325	$500	3.5	7,990.0	$1,670	$976
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,650	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$498	$325	$500	195.1	8,185.1	$1,747	$998
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$512	$325	$500	88.3	8,273.4	$2,068	$1,012
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,900	$517	$325	$500	31.0	8,304.4	$2,225	$1,017
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,931	$518	$325	$500	4.9	8,309.4	$2,256	$1,018
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$2,309	$519	$325	$500	8.5	8,317.8	$2,634	$1,019

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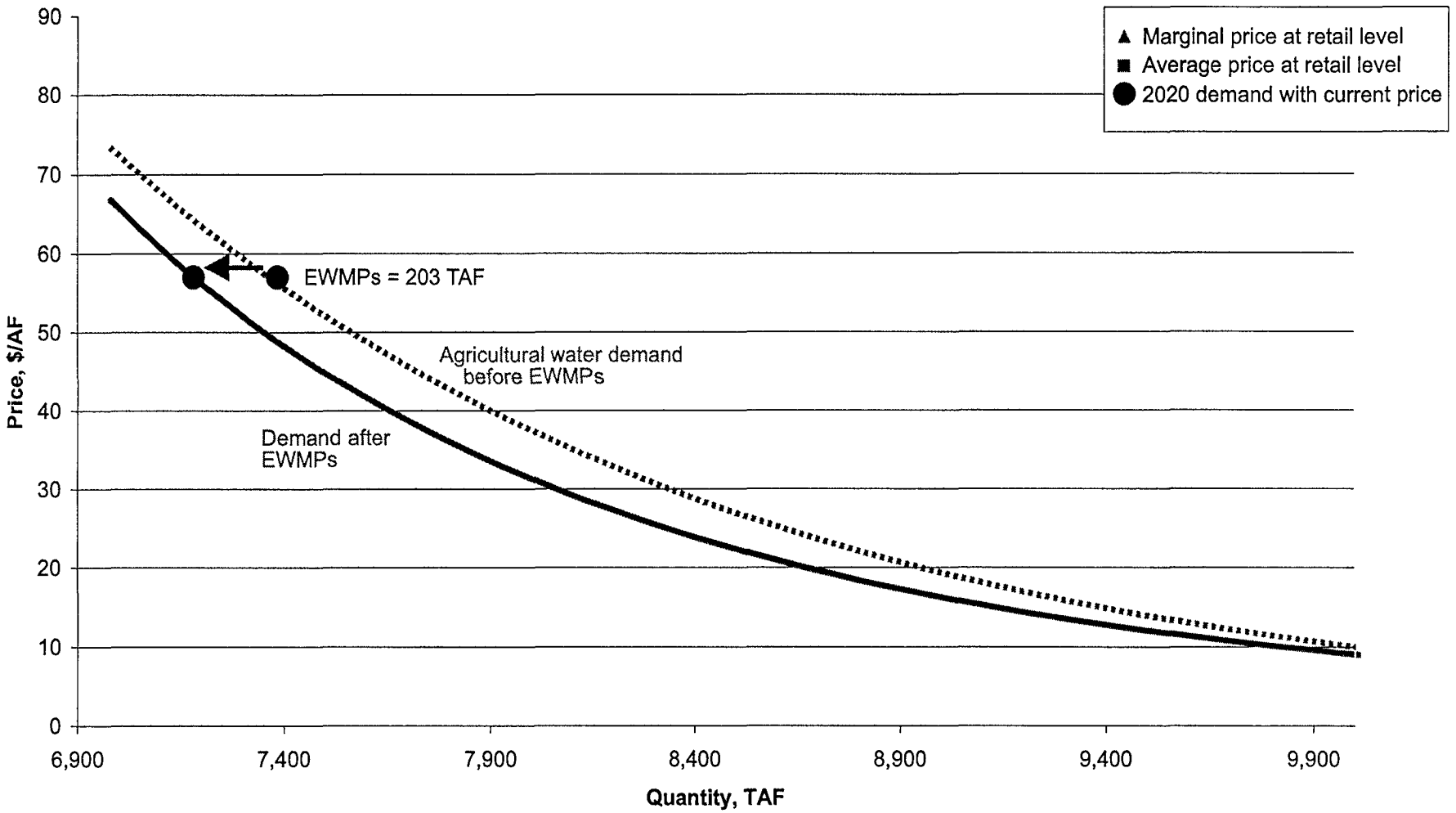

Chart 53
Screening Level Analysis
Land Fallowing Cost Sensitivity Analysis
Sacramento River Region

D-013638

Table 53

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LAND FALLOWING COST SENSITIVITY ANALYSIS
SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

Options screened to meet demand

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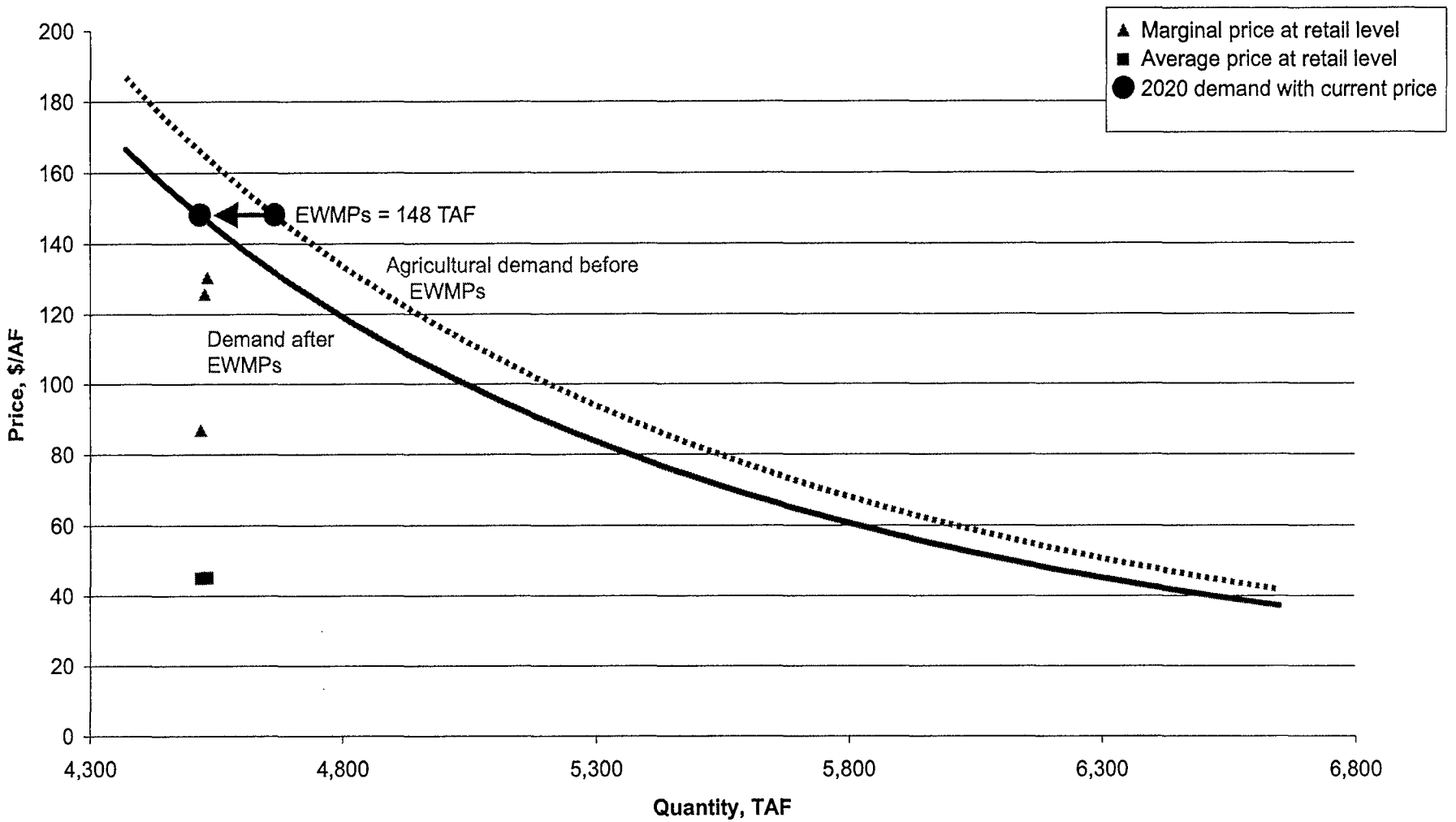

Chart 54
Screening Level Analysis
Land Fallowing Cost Sensitivity Analysis
San Joaquin River Region

D-013640

D-013640

Table 54

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LAND FALLOWING COST SENSITIVITY ANALYSIS
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
										At Farm			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	South Delta Improvements	65	$110	1.15	1	0.106	$30	$0	7.9	$126	4,527	$126	$45.15
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.106	$0	$0	4.9	$130	4,532	$130	$45.24

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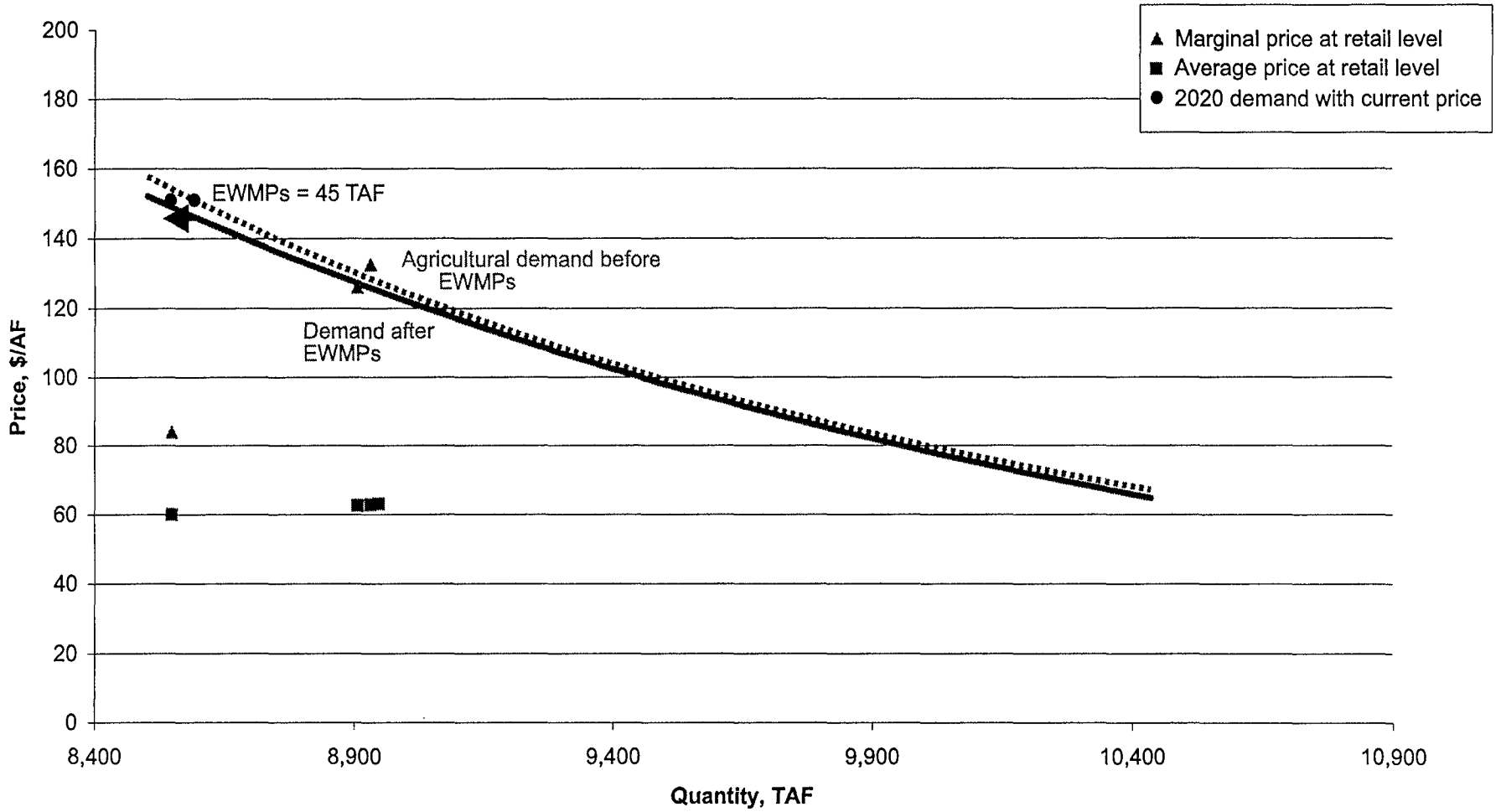

Chart 55
Screening Level Analysis
Land Fallowing Cost Sensitivity Analysis
Tulare Lake Region

D-013642

D-013642

Table 55

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, LAND FALLOWING COST SENSITIVITY ANALYSIS
TULARE LAKE REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,907	$126	$62.65
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,932	$132	$62.85
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0.322	$60	$25	15.3	$211	8,947	$211	$63.10

D-013643

D—013643

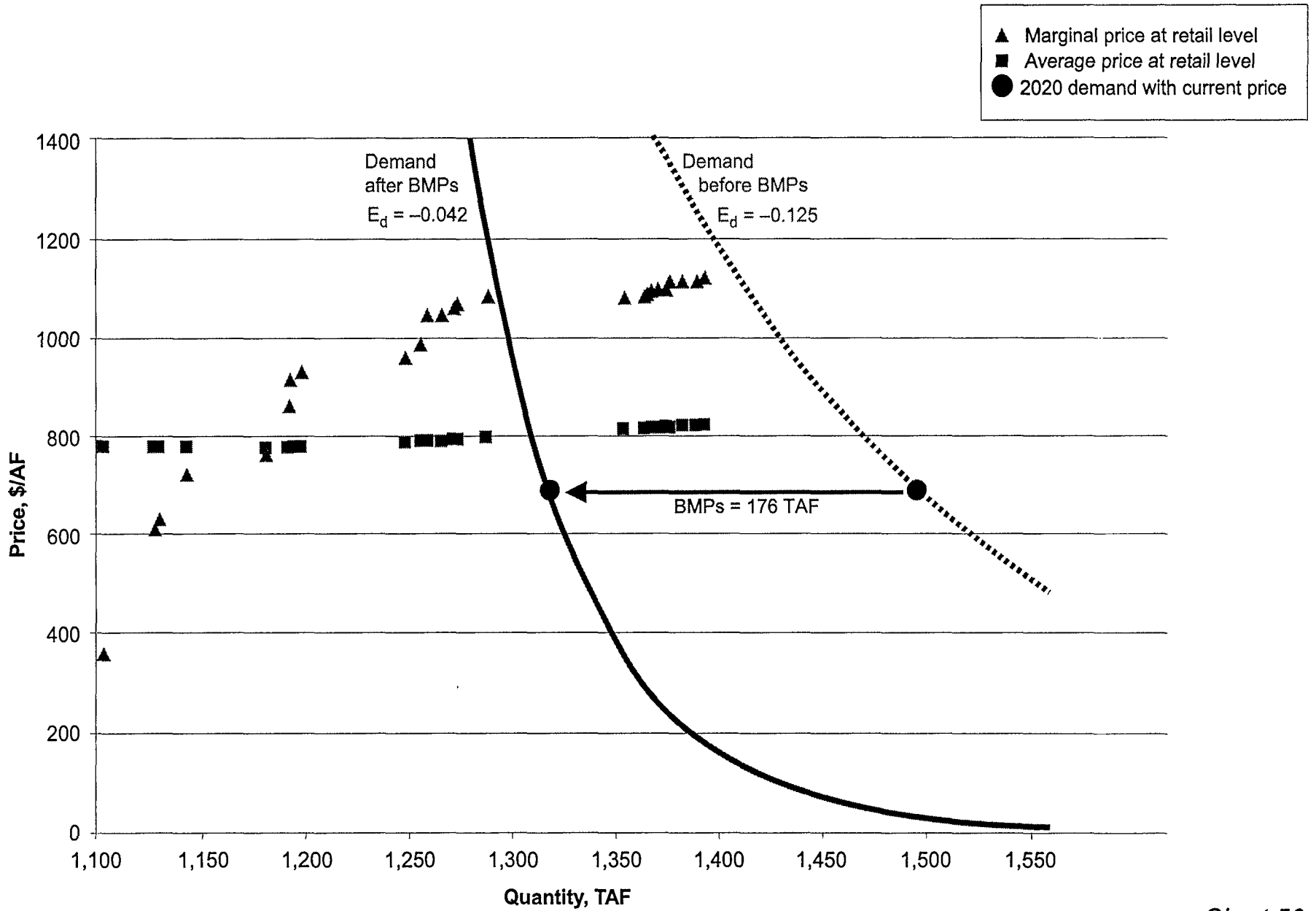

Chart 56
Screening Level Analysis
Membrane Treatment Cost Sensitivity Analysis
San Francisco Bay Region

D-013644
D-013644

TABLE 56

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, MEMBRANE TREATMENT COST SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive P_M Marginal Unit Cost $/AF	Retail Cost Additive P_M Average Unit Cost $/AF	At Destination Q_D Retail Quantity (TAF/year)	At Destination Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			828																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$263	$482	$520	25.0	1103.0	$362	$783
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$260	$482	$520	25.0	1,128.0	$612	$780
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$260	$482	$520	2.0	1,130.0	$632	$780
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$260	$482	$520	13.0	1,143.0	$722	$780
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$260	$482	$520	38.0	1,181.0	$762	$780
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$261	$482	$520	11.0	1,192.0	$862	$781
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	10%	0.094	$60	$25	$209	$0	$0	$433	$262	$482	$520	0.6	1,192.6	$915	$782
Other	Delta	South Delta Improvements	65	$110	1	1	10%	0.094	$90	$0	$209	$0	$0	$450	$262	$482	$520	5.5	1,198.1	$932	$782
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$271	$482	$520	50.0	1,248.1	$962	$791
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1	1	10%	0.164	$90	$0	$209	$0	$0	$507	$273	$482	$520	7.4	1,255.5	$989	$793
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	10%	0.094	$90	$25	$209	$0	$0	$563	$273	$482	$520	2.7	1,258.2	$1,045	$793
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$563	$275	$482	$520	7.1	1,265.3	$1,045	$795
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	10%	0.164	$90	$25	$209	$0	$0	$576	$276	$482	$520	5.9	1,271.2	$1,058	$796
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	10%	0.164	$90	$0	$209	$0	$0	$584	$277	$482	$520	1.3	1,272.5	$1,066	$797
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.164	$60	$25	$209	$0	$0	$596	$280	$482	$520	14.8	1,287.3	$1,080	$800
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.013	$90	$0	$209	$0	$0	$600	$282	$482	$520	5.3	1,292.5	$1,082	$802
Additional options to the right of the demand function (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1	1	10%	0.151	$90	$0	$209	$0	$0	$600	$296	$482	$520	61.2	1,353.7	$1,082	$816
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$298	$482	$520	10.0	1,363.7	$1,082	$818
Land Fallow	San Joaquin	Range 1	12	$224	1	1	10%	0.164	$90	$25	$209	$0	$0	$603	$299	$482	$520	1.8	1,365.4	$1,085	$819
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$611	$299	$482	$520	1.2	1,366.6	$1,093	$819
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$613	$300	$482	$520	3.3	1,369.9	$1,095	$820
Surface Storage	Sacramento	Sac. River Onstream Low Yield Est.	0	$260	1	1	10%	0.164	$90	$0	$209	$0	$0	$615	$300	$482	$520	0.0	1,369.9	$1,097	$820
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$615	$300	$482	$520	3.8	1,373.7	$1,097	$820
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$301	$482	$520	2.0	1,375.7	$1,112	$821
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	10%	0.164	$90	$25	$209	$0	$0	$631	$302	$482	$520	5.9	1,381.6	$1,113	$822
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$631	$304	$482	$520	7.1	1,388.7	$1,113	$824
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$639	$305	$482	$520	3.3	1,392.0	$1,121	$825
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$644	$306	$482	$520	3.8	1,395.8	$1,126	$826
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$652	$306	$482	$520	3.0	1,398.8	$1,134	$826
Land Fallow	San Joaquin	Range 2	12	$279	1	1	10%	0.164	$90	$25	$209	$0	$0	$663	$307	$482	$520	1.8	1,400.5	$1,145	$827
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$670	$308	$482	$520	3.3	1,403.8	$1,152	$828
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$676	$309	$482	$520	3.8	1,407.6	$1,158	$829
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$319	$482	$520	39.0	1,446.6	$1,162	$839
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	10%	0.164	$90	$25	$209	$0	$0	$686	$320	$482	$520	5.9	1,452.5	$1,168	$840
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$698	$321	$482	$520	1.2	1,453.7	$1,180	$841
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$698	$321	$482	$520	3.0	1,456.7	$1,180	$841
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$700	$323	$482	$520	7.1	1,463.8	$1,182	$843
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$703	$324	$482	$520	3.3	1,467.1	$1,185	$844
Land Fallow	Sacramento	Range 12	32	$256	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$709	$325	$482	$520	3.8	1,470.9	$1,191	$845
Land Fallow	San Joaquin	Range 3	12	$336	1	1	10%	0.164	$90	$25	$209	$0	$0	$726	$325	$482	$520	1.8	1,472.6	$1,208	$845
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$734	$326	$482	$520	3.3	1,475.9	$1,216	$846
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$740	$327	$482	$520	3.8	1,479.7	$1,222	$847
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$745	$328	$482	$520	3.0	1,482.7	$1,227	$848
Land Fallow	Tulare	Range 1	67	$367	1	1	10%	0.164	$60	$25	$209	$0	$0	$749	$331	$482	$520	9.9	1,492.6	$1,231	$851
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$769	$333	$482	$520	7.1	1,499.6	$1,251	$853
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$793	$334	$482	$520	3.0	1,502.6	$1,275	$854
Land Fallow	San Joaquin	Range 4	12	$406	1	1	10%	0.164	$90	$25	$209	$0	$0	$802	$335	$482	$520	1.8	1,504.4	$1,284	$855
Land Fallow	Tulare	Range 2	67	$438	1	1	10%	0.164	$60	$25	$209	$0	$0	$806	$338	$482	$520	9.9	1,514.3	$1,287	$858
Land Fallow	Sacramento	Range 17	10	$365	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$844	$338	$482	$520	1.2	1,515.4	$1,326	$858
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	10%	0.164	$60	$25	$209	$0	$0	$846	$338	$482	$520	0.7	1,516.2	$1,328	$858
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$361	$482	$520	70.0	1,586.2	$1,332	$881
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$853	$362	$482	$520	3.0	1,589.1	$1,335	$882
Land Fallow	San Joaquin	Range 5	21	$452	1	1	10%	0.164	$90	$25	$209	$0	$0	$854	$363	$482	$520	3.1	1,592.2	$1,336	$883
Land Fallow	Tulare	Range 3	67	$490	1	1	10%	0.164	$60	$25	$209	$0	$0	$862	$366	$482	$520	9.9	1,602.1	$1,344	$886
Land Fallow	Tulare	Range 4	36	$492	1	1	10%	0.164	$60	$25	$209	$0	$0	$865	$367	$482	$520	5.3	1,607.4	$1,347	$887
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$393	$482	$520	85.0	1,692.4	$1,362	$913
Land Fallow	San Joaquin	Range 6	12	$483	1	1	10%	0.164	$90	$25	$209	$0	$0	$888	$394	$482	$520	1.8	1,694.2	$1,370	$914
Land Fallow	Tulare	Range 5	36	$540	1	1	10%	0.164	$60	$25	$209	$0	$0	$918	$395	$482	$520	5.3	1,699.5	$1,400	$915
Land Fallow	Tulare	Range 6	67	$542	1	1	10%	0.164	$60	$25	$209	$0	$0	$919	$396	$482	$520	9.9	1,709.4	$1,401	$916
Land Fallow	San Joaquin	Range 7	21	$522	1	1	10%	0.164	$90	$25	$209	$0	$0	$930	$399	$482	$520	3.1	1,712.5	$1,412	$919
Land Fallow	Tulare	Range 7	36	$588	1	1	10%	0.164	$60	$25	$209	$0	$0	$971	$401	$482	$520	5.3	1,717.8	$1,453	$921
Land Fallow	Tulare	Range 8	67	$594	1	1	10%	0.164	$60	$25	$209	$0	$0	$976	$404	$482	$520	9.9	1,727.7	$1,458	$924
Land Fallow	Tulare	Range 9	19	$607	1	1	10%	0.164	$60	$25	$209	$0	$0	$991	$405	$482	$520	2.8	1,730.5	$1,473	$925
Land Fallow	San Joaquin	Range 8	21	$590	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,006	$406	$482	$520	3.1	1,733.6	$1,487	$926
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$409	$482	$520	7.0	1,740.6	$1,487	$929

D-013645

D—013645

TABLE 56

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, MEMBRANE TREATMENT COST SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_0 Quantity (TAF/year)	At Source (dry condition) C_0 Unit Cost ($/AF)	F_R Reapplication Factor	F_B Delta Loss Factor	F_M MT Brine Loss Factor	F_A Share of New Supply Factor	C_c Transport Cost	C_T Transaction Fee, $/AF	C_D Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Land Fallow	Tulare	Range 10	36	$835	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,022	$411	$482	$520	5.3	1,745.9	$1,504	$931
Land Fallow	Tulare	Range 11	19	$848	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,037	$412	$482	$520	2.8	1,748.7	$1,519	$932
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$1,057	$412	$482	$520	1.2	1,749.9	$1,539	$932
Land Fallow	Tulare	Range 12	36	$863	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,075	$414	$482	$520	5.3	1,755.2	$1,557	$934
Land Fallow	Tulare	Range 13	19	$868	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,061	$415	$482	$520	2.8	1,758.0	$1,563	$935
Land Fallow	San Joaquin	Range 9	21	$859	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,061	$416	$482	$520	3.1	1,761.1	$1,563	$936
Land Fallow	San Joaquin	Range 10	13	$894	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,119	$417	$482	$520	1.9	1,763.1	$1,601	$937
Land Fallow	Tulare	Range 14	19	$730	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,126	$418	$482	$520	2.8	1,765.9	$1,608	$938
Land Fallow	San Joaquin	Range 11	21	$728	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,158	$420	$482	$520	3.1	1,769.0	$1,640	$940
Land Fallow	San Joaquin	Range 12	13	$734	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,163	$420	$482	$520	1.9	1,770.9	$1,645	$940
Land Fallow	Tulare	Range 15	19	$771	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,172	$422	$482	$520	2.8	1,773.7	$1,654	$942
Land Fallow	San Joaquin	Range 13	13	$775	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,209	$422	$482	$520	1.9	1,775.6	$1,691	$942
Land Fallow	San Joaquin	Range 14	13	$815	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,253	$423	$482	$520	1.9	1,777.5	$1,735	$943
Land Fallow	Sacramento	Range 20	10	$666	1	0.8	10%	0.164	$90	$25	$209	$0	$0	$1,272	$424	$482	$520	1.2	1,778.7	$1,754	$944
Surface Storage	*San Joaquin*	*Aqueduct Offstream High Yield Est.*	310	$876	1	1	10%	0.164	$90	$0	$209	$0	$0	$1,293	$446	$482	$520	45.8	1,824.5	$1,775	$956
Land Fallow	San Joaquin	Range 15	13	$856	1	1	10%	0.164	$90	$25	$209	$0	$0	$1,296	$447	$482	$520	1.9	1,826.4	$1,780	$957
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,366	$447	$482	$520	0.7	1,827.1	$1,850	$957
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develop.	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$476	$482	$520	50.0	1,877.1	$2,012	$996
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$496	$482	$520	28.0	1,905.1	$2,362	$1,016
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	10%	0.164	$60	$25	$209	$0	$0	$1,973	$501	$482	$520	6.5	1,911.6	$2,455	$1,021
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	10%	0.164	$90	$25	$209	$0	$0	$2,006	$502	$482	$520	1.0	1,912.6	$2,488	$1,022
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	10%	0.16	$90	$25	$209	$0	$0	$2,419	$504	$482	$520	1.8	1,914.4	$2,901	$1,024

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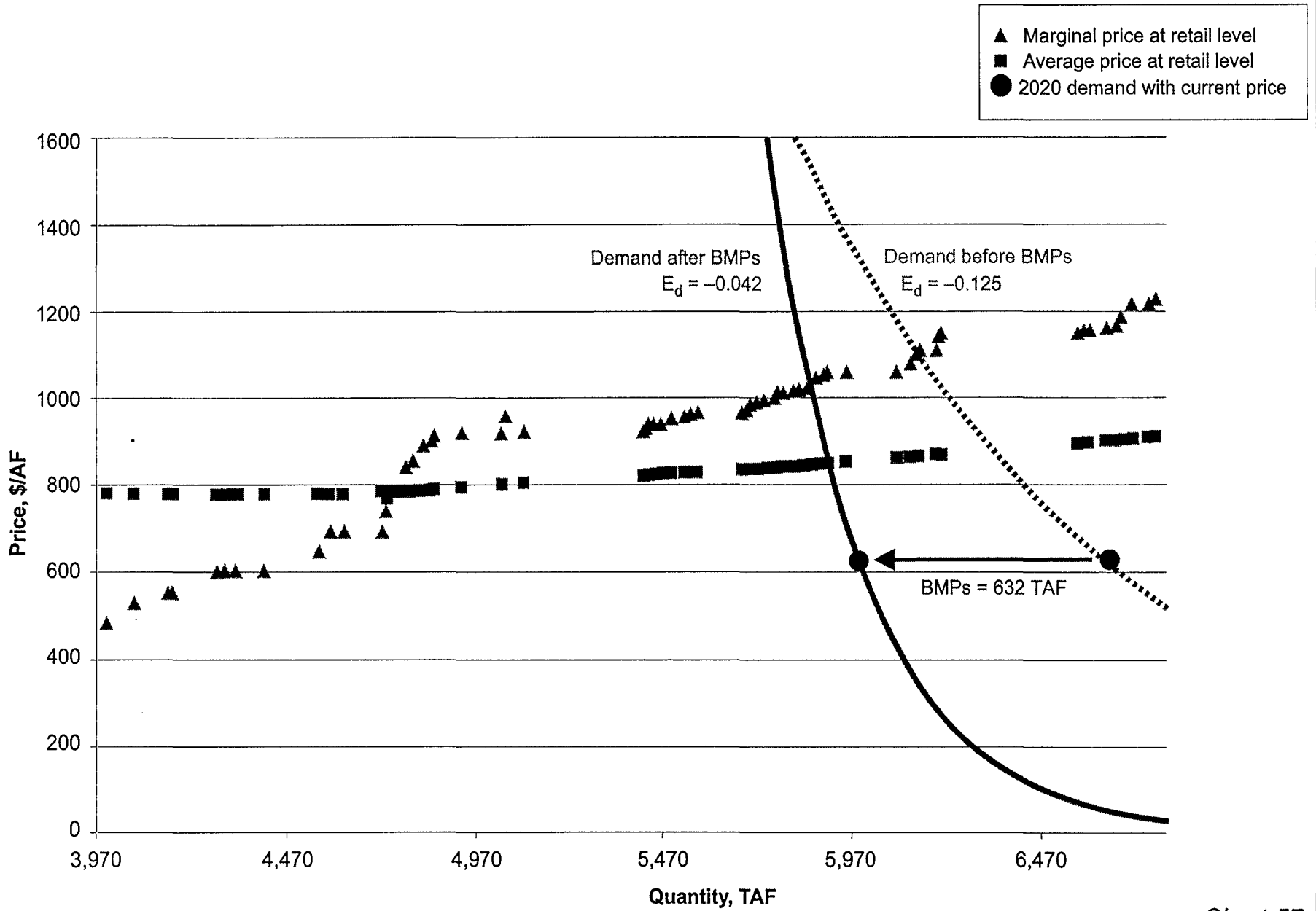

Chart 57

Screening Level Analysis
Membrane Treatment Cost Sensitivity Analysis
South Coast Region

Table 57
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, MEMBRANE TREATMENT COST SENSITIVITY ANALYSIS
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_0 Quantity (TAF/year)	At Source (dry condition) C_0 Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$281	$325	$500	24.0	3995.9	$486	$781
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$60	$25	$0	$0	$0	$208	$279	$325	$500	70.9	4,066.7	$531	$779
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$278	$325	$500	91.6	4,158.3	$554	$778
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$278	$325	$500	7.6	4,165.9	$554	$778
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$278	$325	$500	119.9	4,285.8	$600	$778
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$278	$325	$500	20.7	4,306.5	$605	$778
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$278	$325	$500	26.3	4,334.9	$605	$778
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$278	$325	$500	74.1	4,409.0	$605	$778
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$280	$325	$500	141.7	4,550.7	$646	$780
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$280	$325	$500	29.4	4,580.1	$692	$780
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$281	$325	$500	32.7	4,612.8	$692	$781
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$283	$325	$500	109.0	4,721.8	$692	$783
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$283	$325	$500	10.9	4,732.7	$738	$783
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$209	$0	$0	$448	$283	$325	$500	2.4	4,735.1	$773	$783
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.344	$140	$0	$209	$0	$0	$463	$284	$325	$500	21.9	4,757.0	$788	$784
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.09	1	10%	0.601	$140	$0	$209	$0	$0	$516	$285	$325	$500	29.5	4,786.5	$841	$785
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.344	$140	$25	$209	$0	$0	$529	$286	$325	$500	13.5	4,800.0	$854	$786
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	10%	0.601	$140	$25	$209	$0	$0	$567	$288	$325	$500	28.3	4,828.3	$892	$788
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	10%	0.601	$140	$25	$209	$0	$0	$579	$289	$325	$500	23.6	4,851.9	$904	$789
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.09	1	10%	0.601	$140	$0	$209	$0	$0	$586	$289	$325	$500	5.3	4,857.2	$911	$789
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$294	$325	$500	73.0	4,930.2	$921	$794
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$300	$325	$500	109.0	5,039.2	$921	$800
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	10%	0.601	$110	$25	$209	$0	$0	$599	$304	$325	$500	59.0	5,098.2	$924	$804
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.09	1	10%	0.718	$140	$0	$209	$0	$0	$800	$321	$325	$500	317.0	5,415.1	$925	$821
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$804	$322	$325	$500	8.5	5,423.6	$929	$822
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$811	$322	$325	$500	5.6	5,429.2	$936	$822
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$813	$323	$325	$500	15.8	5,445.0	$938	$823
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$815	$324	$325	$500	18.0	5,463.0	$940	$824
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$830	$325	$325	$500	28.2	5,491.2	$955	$825
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$830	$327	$325	$500	33.8	5,525.0	$955	$827
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$837	$328	$325	$500	15.8	5,540.8	$962	$828
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$842	$329	$325	$500	18.0	5,558.8	$967	$829
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$842	$336	$325	$500	119.9	5,678.7	$967	$836
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$848	$337	$325	$500	14.2	5,692.9	$973	$837
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$869	$337	$325	$500	8.5	5,701.4	$984	$837
Land Fallow	Sacramento	Range 7	28	$228	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$865	$338	$325	$500	15.8	5,717.1	$990	$838
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$870	$339	$325	$500	18.0	5,735.2	$995	$839
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$880	$341	$325	$500	28.2	5,763.3	$1,005	$841
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$890	$341	$325	$500	5.7	5,769.0	$1,015	$841
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$890	$342	$325	$500	14.2	5,783.2	$1,015	$842
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$893	$344	$326	$500	33.8	5,817.0	$1,018	$844
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$895	$345	$325	$500	15.8	5,832.8	$1,020	$845
Land Fallow	Sacramento	Range 12	32	$256	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$701	$348	$325	$500	18.0	5,850.8	$1,026	$846
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.1	$140	$25	$209	$0	$0	$717	$348	$325	$500	1.2	5,852.0	$1,042	$846
Additional options to the right of the demand function (after BMP's)																					
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.618	$140	$25	$209	$0	$0	$717	$348	$325	$500	7.3	5,859.3	$1,042	$846
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$724	$347	$325	$500	15.8	5,875.1	$1,049	$847
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$729	$348	$325	$500	18.0	5,893.1	$1,054	$849
Land Fallow	Sacramento	Range 15	26	$283	1.09	0.8	10%	0.48	$140	$25	$209	$0	$0	$734	$349	$325	$500	9.4	5,902.5	$1,059	$849
Land Fallow	Sacramento	Range 15	25	$283	1.09	0.8	10%	0.238	$140	$25	$209	$0	$0	$734	$350	$325	$500	4.7	5,907.2	$1,059	$850
Land Fallow	Tulare	Range 1	67	$387	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$738	$353	$325	$500	47.2	5,954.4	$1,063	$853
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$758	$355	$325	$500	33.8	5,988.2	$1,081	$855
Land Fallow	Sacramento	Range 16	25	$317	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$778	$356	$325	$500	14.2	6,002.4	$1,103	$856
Land Fallow	San Joaquin	Range 4	12	$406	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$787	$357	$325	$500	8.5	6,010.8	$1,112	$857
Land Fallow	Tulare	Range 2	67	$438	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$789	$360	$325	$500	47.2	6,058.0	$1,114	$860
Land Fallow	Sacramento	Range 17	10	$365	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$825	$360	$325	$500	5.6	6,063.7	$1,150	$860
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$366	$325	$500	359.7	6,423.4	$1,151	$866
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$827	$367	$325	$500	3.5	6,426.9	$1,152	$867
Land Fallow	Sacramento	Range 18	25	$362	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$833	$368	$326	$500	14.1	6,441.0	$1,158	$868
Land Fallow	San Joaquin	Range 5	21	$452	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$834	$369	$325	$500	14.8	6,455.8	$1,159	$869
Land Fallow	Tulare	Range 3	67	$490	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$841	$392	$325	$500	47.2	6,502.9	$1,166	$892
Land Fallow	Tulare	Range 4	36	$492	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$844	$394	$325	$500	25.4	6,528.3	$1,169	$894
Land Fallow	San Joaquin	Range 6	12	$483	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$865	$394	$325	$500	8.5	6,536.8	$1,190	$894
Land Fallow	Tulare	Range 5	36	$540	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$892	$396	$325	$500	25.4	6,562.1	$1,217	$896
Land Fallow	Tulare	Range 6	67	$542	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$894	$400	$325	$500	47.2	6,609.3	$1,219	$900
Land Fallow	San Joaquin	Range 7	21	$522	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$904	$401	$325	$500	14.8	6,624.1	$1,229	$901

Additional options that meet screening criteria but are more expensive than those shown on the chart

D-013648

D—013648

Table 57
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, MEMBRANE TREATMENT COST SENSITIVITY ANALYSIS
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	At Destination, Retail Price Using: P_D Marginal Cost at Retail	At Destination, Retail Price Using: P_D Average Cost at Retail
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$409	$325	$500	109.0	6,733.1	$1,242	$909
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$411	$325	$500	20.7	6,753.8	$1,265	$911
Land Fallow	Tulare	Range 7	36	$588	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$941	$413	$325	$500	25.4	6,779.2	$1,266	$913
Land Fallow	Tulare	Range 8	67	$594	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$946	$417	$325	$500	47.2	6,826.4	$1,271	$917
Land Fallow	Tulare	Range 9	19	$607	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$960	$418	$325	$500	13.4	6,839.7	$1,286	$918
Land Fallow	San Joaquin	Range 8	21	$590	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$972	$419	$325	$500	14.8	6,854.5	$1,297	$919
Land Fallow	Tulare	Range 10	36	$635	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$988	$421	$325	$500	25.4	6,879.9	$1,313	$921
Land Fallow	Tulare	Range 11	19	$648	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$1,001	$422	$325	$500	13.4	6,893.3	$1,326	$922
Land Fallow	Sacramento	Range 19	10	$510	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$1,020	$423	$325	$500	5.6	6,898.9	$1,345	$923
Land Fallow	Tulare	Range 12	36	$663	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$1,036	$425	$325	$500	25.4	6,924.3	$1,361	$925
Land Fallow	Tulare	Range 13	19	$688	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$1,042	$426	$325	$500	13.4	6,937.6	$1,367	$926
Land Fallow	San Joaquin	Range 9	21	$669	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$1,042	$427	$325	$500	14.8	6,952.4	$1,367	$927
Land Fallow	San Joaquin	Range 10	13	$694	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$1,077	$428	$325	$500	9.2	6,961.6	$1,402	$928
Land Fallow	Tulare	Range 14	19	$730	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$1,084	$429	$325	$500	13.4	6,975.0	$1,409	$929
Land Fallow	San Joaquin	Range 11	21	$728	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$1,112	$431	$325	$500	14.8	6,989.8	$1,437	$931
Land Fallow	San Joaquin	Range 12	13	$734	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$1,118	$432	$325	$500	9.2	6,998.9	$1,443	$932
Land Fallow	Tulare	Range 15	19	$771	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$1,125	$433	$325	$500	13.4	7,012.3	$1,450	$933
Land Fallow	San Joaquin	Range 13	13	$775	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$1,160	$434	$325	$500	9.2	7,021.5	$1,485	$934
Land Fallow	San Joaquin	Range 14	13	$815	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$1,200	$435	$325	$500	9.2	7,030.6	$1,525	$935
Land Fallow	Sacramento	Range 20	10	$666	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$1,217	$436	$325	$500	5.6	7,036.3	$1,542	$936
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.09	1	10%	0.718	$140	$0	$209	$0	$0	$1,236	$460	$325	$500	218.4	7,254.6	$1,561	$960
Land Fallow	San Joaquin	Range 15	13	$856	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$1,242	$461	$325	$500	9.2	7,263.8	$1,567	$961
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$463	$325	$500	20.7	7,284.5	$1,609	$963
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$475	$325	$500	109.0	7,393.5	$1,609	$975
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$524	$325	$500	474.2	7,867.6	$1,609	$1,024
Ag WUE	Tulare	Increase efficiency, Range 3	5	$960	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$1,306	$524	$325	$500	3.5	7,871.1	$1,631	$1,024
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,650	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$546	$325	$500	195.1	8,066.3	$1,747	$1,046
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$559	$325	$500	88.3	8,154.5	$2,068	$1,059
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$209	$0	$0	$1,861	$564	$325	$500	31.0	8,185.5	$2,186	$1,064
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$209	$0	$0	$1,891	$565	$325	$500	4.9	8,190.5	$2,216	$1,065
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$209	$0	$0	$2,270	$566	$325	$500	8.5	8,198.9	$2,595	$1,066

D-013649

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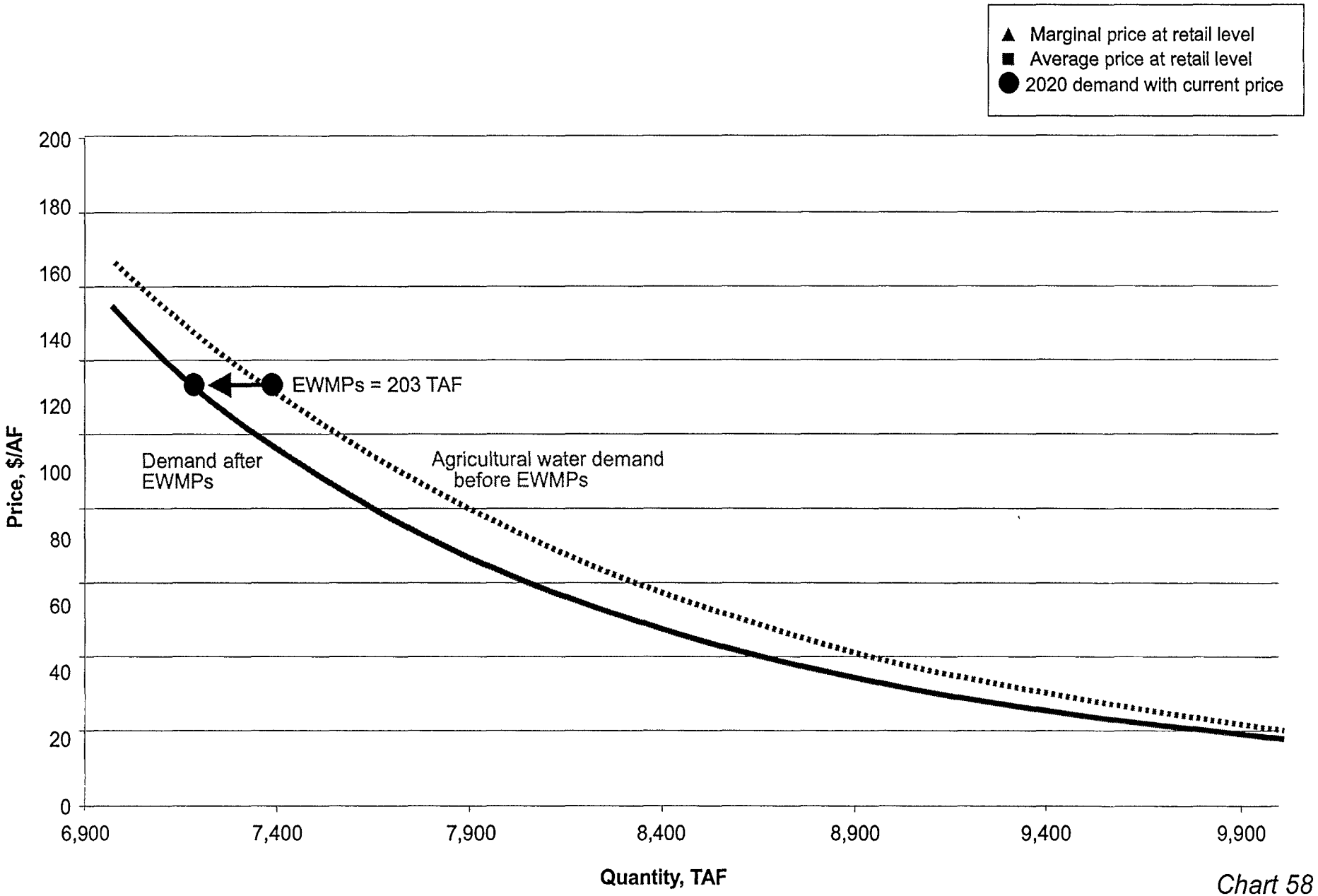

Chart 58

Screening Level Analysis
Membrane Treatment Cost Sensitivity Analysis
Sacramento River Region

D-013650

D-013650

Table 58

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, MEMBRANE TREATMENT COST SENSITIVITY ANALYSIS SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

Options screened to meet demand

D-013651

D-013651

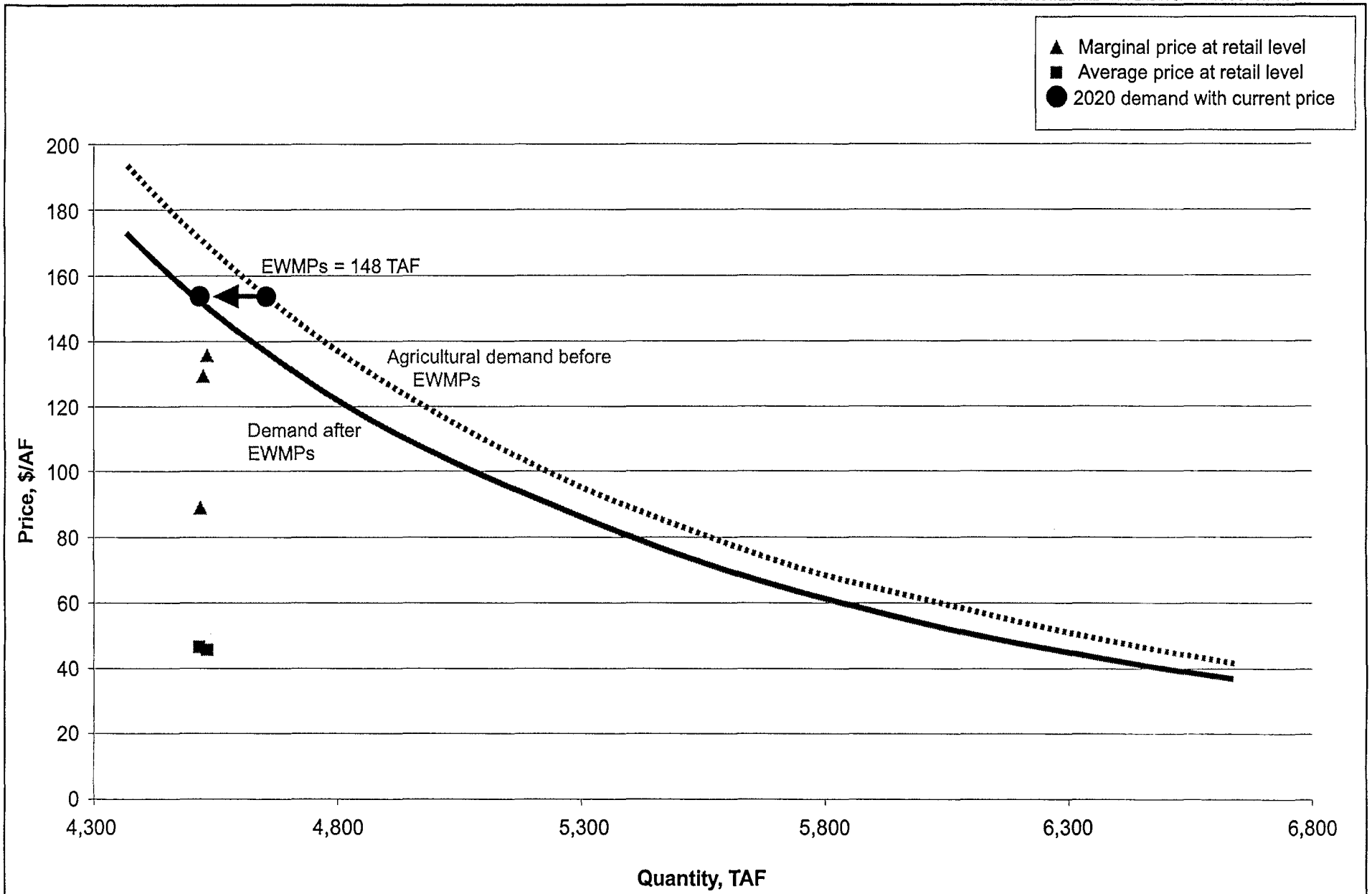

Chart 59

Screening Level Analysis
Membrane Treatment Cost Sensitivity Analysis
San Joaquin River Region

D-013652

Table 59

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, MEMBRANE TREATMENT COST SENSITIVITY ANALYSIS
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
										At Farm			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	South Delta Improvements	65	$110	1.15	1	0.106	$30	$0	7.9	$126	4,527	$126	$45.15
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.106	$0	$0	4.9	$130	4,532	$130	$45.24

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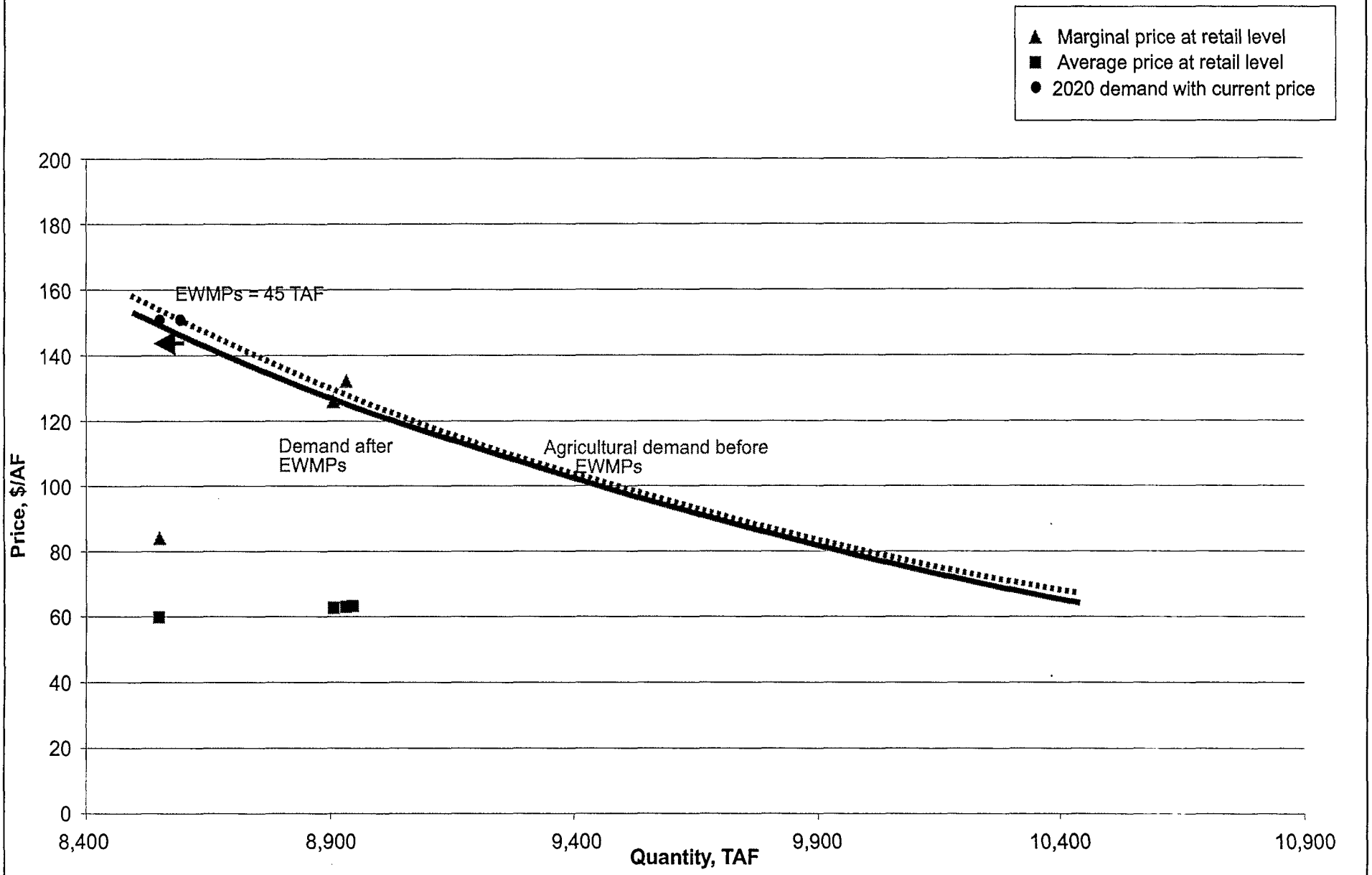

Chart 60

Screening Level Analysis
Membrane Treatment Cost Sensitivity Analysis
Tulare Lake Region

Table 60

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, MEMBRANE TREATMENT COST SENSITIVITY ANALYSIS
TULARE LAKE REGION

Option			At Source (dry condition)							At Destination				
										At Farm			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,907	$126	$62.65
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,932	$132	$62.85
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0.322	$60	$25	15.3	$211	8,947	$211	$63.10

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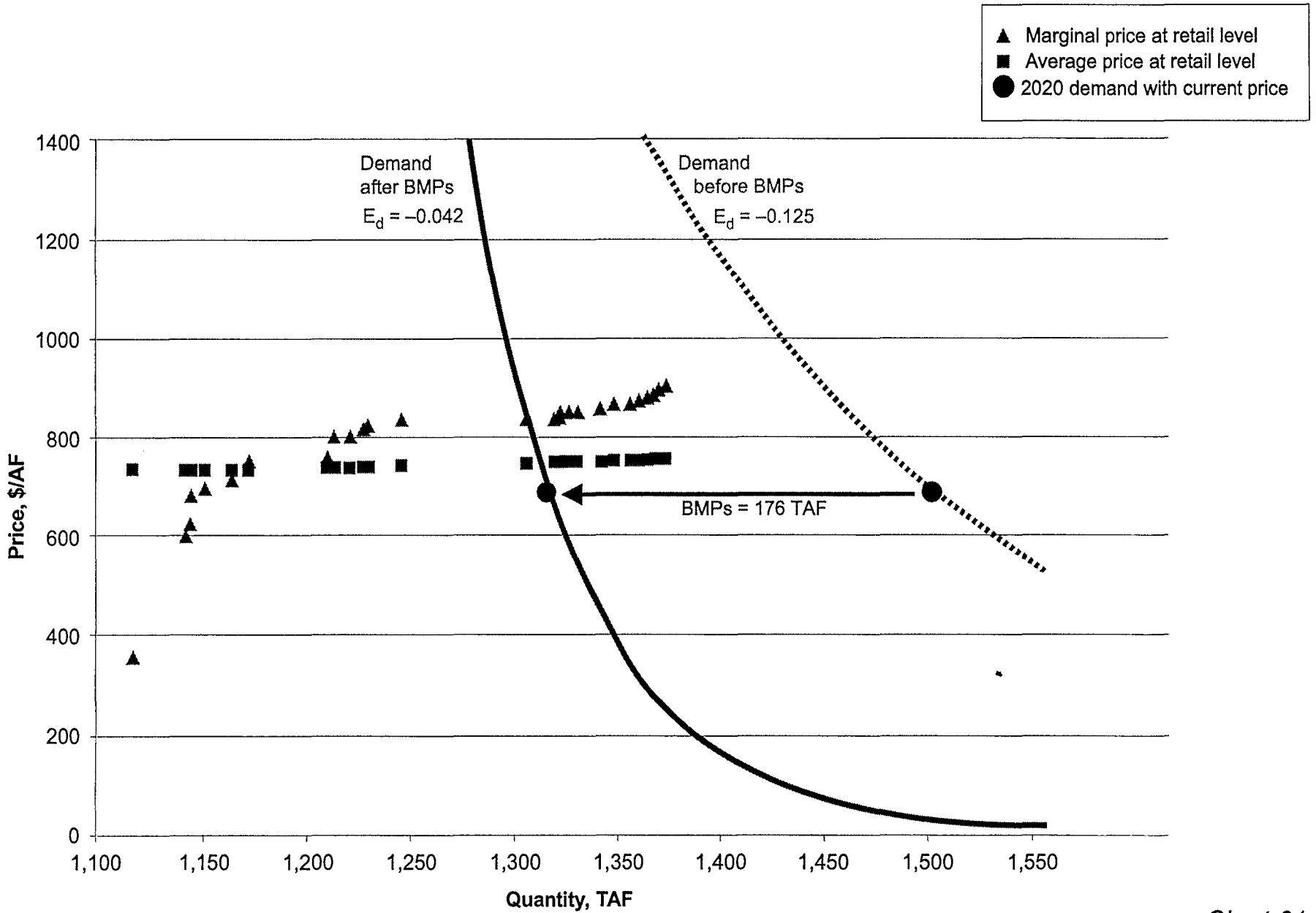

Chart 61

Screening Level Analysis
Ultraviolet Radiation Treatment Sensitivity Analysis
San Francisco Bay Region

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Table 61
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ULTRAVIOLET RADIATION TREATMENT SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$223	$482	$520	25.0	1118.0	$362	$743
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$221	$482	$520	25.0	1,143.0	$612	$741
Other	S.F. Bay	Conjunctiva Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$220	$482	$520	2.0	1,145.0	$632	$740
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	0%	0.094	$60	$25	$24	$0	$0	$209	$220	$482	$520	0.7	1,145.7	$691	$740
Other	Delta	South Delta Improvements	65	$110	1	1	0%	0.094	$90	$0	$24	$0	$0	$224	$220	$482	$520	6.1	1,151.8	$706	$740
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$221	$482	$520	13.0	1,164.8	$722	$741
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$182	1	1	0%	0.164	$90	$0	$24	$0	$0	$278	$221	$482	$520	8.2	1,173.0	$758	$741
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpod	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$223	$482	$520	38.0	1,211.0	$762	$743
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	0%	0.094	$90	$25	$24	$0	$0	$327	$223	$482	$520	3.0	1,214.0	$809	$743
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$327	$224	$482	$520	7.9	1,221.8	$809	$744
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	0%	0.164	$90	$25	$24	$0	$0	$339	$224	$482	$520	6.6	1,228.4	$821	$744
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	0%	0.164	$90	$0	$24	$0	$0	$348	$225	$482	$520	1.5	1,229.9	$828	$745
Active Conj. Use	Tulare	Project 1	100	$250	1	1	0%	0.164	$60	$25	$24	$0	$0	$359	$226	$482	$520	16.4	1,246.3	$841	$746
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1	1	0%	0.1328	$90	$0	$24	$0	$0	$360	$233	$482	$520	59.8	1,306.0	$842	$753
Additional options to the right of the demand function (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1	1	0%	0.0312	$90	$0	$24	$0	$0	$360	$234	$482	$520	14.0	1,320.1	$842	$754
Land Fallow	San Joaquin	Range 1	12	$224	1	1	0%	0.164	$90	$25	$24	$0	$0	$363	$234	$482	$520	2.0	1,322.1	$845	$754
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$371	$234	$482	$520	1.3	1,323.4	$853	$754
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$372	$235	$482	$520	3.7	1,327.0	$854	$755
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$374	$235	$482	$520	4.2	1,331.2	$856	$755
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$236	$482	$520	11.0	1,342.2	$862	$756
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	0%	0.164	$90	$25	$24	$0	$0	$389	$237	$482	$520	6.6	1,348.8	$871	$757
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$389	$238	$482	$520	7.9	1,356.7	$871	$758
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$396	$238	$482	$520	3.7	1,360.3	$878	$758
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$401	$239	$482	$520	4.2	1,364.5	$883	$759
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$407	$239	$482	$520	3.3	1,367.8	$889	$759
Land Fallow	San Joaquin	Range 2	12	$279	1	1	0%	0.164	$90	$25	$24	$0	$0	$418	$239	$482	$520	2.0	1,369.8	$900	$759
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$424	$240	$482	$520	3.7	1,373.5	$906	$760
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$429	$240	$482	$520	4.2	1,377.7	$911	$760
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	0%	0.164	$90	$25	$24	$0	$0	$439	$241	$482	$520	6.6	1,384.2	$921	$761
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$449	$242	$482	$520	1.3	1,385.6	$931	$762
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$449	$242	$482	$520	3.3	1,388.9	$931	$762
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$452	$243	$482	$520	7.9	1,396.7	$934	$763
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$454	$244	$482	$520	3.7	1,400.4	$936	$764
Land Fallow	Sacramento	Range 12	32	$256	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$459	$244	$482	$520	4.2	1,404.6	$941	$764
Land Fallow	San Joaquin	Range 3	12	$336	1	1	0%	0.164	$90	$25	$24	$0	$0	$475	$245	$482	$520	2.0	1,406.6	$957	$765
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$253	$482	$520	50.0	1,456.6	$962	$773
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$483	$253	$482	$520	3.7	1,460.3	$965	$773
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$488	$254	$482	$520	4.2	1,464.5	$970	$774
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$493	$255	$482	$520	3.3	1,467.7	$975	$775
Land Fallow	Tulare	Range 1	67	$387	1	1	0%	0.164	$60	$25	$24	$0	$0	$496	$256	$482	$520	11.0	1,478.7	$978	$776
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$514	$258	$482	$520	7.9	1,486.6	$996	$778
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$536	$258	$482	$520	3.3	1,489.9	$1,018	$778
Land Fallow	San Joaquin	Range 4	12	$406	1	1	0%	0.164	$90	$25	$24	$0	$0	$545	$259	$482	$520	2.0	1,491.9	$1,027	$779
Land Fallow	Tulare	Range 2	67	$438	1	1	0%	0.164	$60	$25	$24	$0	$0	$547	$261	$482	$520	11.0	1,502.9	$1,029	$781
Land Fallow	Sacramento	Range 17	10	$355	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$583	$261	$482	$520	1.3	1,504.2	$1,065	$781
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	0%	0.164	$60	$25	$24	$0	$0	$584	$261	$482	$520	0.8	1,505.0	$1,066	$781
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$591	$262	$482	$520	3.3	1,508.3	$1,073	$782
Land Fallow	San Joaquin	Range 5	21	$452	1	1	0%	0.164	$90	$25	$24	$0	$0	$591	$263	$482	$520	3.4	1,511.7	$1,073	$783
Land Fallow	Tulare	Range 3	67	$490	1	1	0%	0.164	$60	$25	$24	$0	$0	$599	$265	$482	$520	11.0	1,522.7	$1,081	$785
Other	S.F. Bay	Surface Storage	10	$800	1	1	0%	1	$0	$0	$0	$0	$0	$600	$267	$482	$520	10.0	1,532.7	$1,082	$787
Land Fallow	Tulare	Range 4	36	$492	1	1	0%	0.164	$60	$25	$24	$0	$0	$601	$269	$482	$520	5.9	1,538.6	$1,083	$789
Land Fallow	San Joaquin	Range 6	12	$483	1	1	0%	0.164	$90	$25	$24	$0	$0	$622	$269	$482	$520	2.0	1,540.6	$1,104	$789
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$270	$482	$520	2.0	1,542.6	$1,112	$790
Land Fallow	Tulare	Range 5	36	$540	1	1	0%	0.164	$60	$25	$24	$0	$0	$649	$271	$482	$520	5.9	1,548.5	$1,131	$791
Land Fallow	Tulare	Range 6	67	$542	1	1	0%	0.164	$60	$25	$24	$0	$0	$651	$274	$482	$520	11.0	1,559.5	$1,133	$794
Land Fallow	San Joaquin	Range 7	21	$522	1	1	0%	0.164	$90	$25	$24	$0	$0	$661	$275	$482	$520	3.4	1,562.9	$1,143	$795
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpod	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$285	$482	$520	39.0	1,601.9	$1,162	$806
Land Fallow	Tulare	Range 7	36	$588	1	1	0%	0.164	$60	$25	$24	$0	$0	$697	$286	$482	$520	5.9	1,607.8	$1,179	$806
Land Fallow	Tulare	Range 8	67	$594	1	1	0%	0.164	$60	$25	$24	$0	$0	$703	$289	$482	$520	11.0	1,618.8	$1,185	$809
Land Fallow	Tulare	Range 9	19	$607	1	1	0%	0.164	$60	$25	$24	$0	$0	$716	$290	$482	$520	3.1	1,621.9	$1,198	$810
Land Fallow	San Joaquin	Range 8	21	$590	1	1	0%	0.164	$90	$25	$24	$0	$0	$729	$291	$482	$520	3.4	1,625.4	$1,211	$811
Land Fallow	Tulare	Range 10	36	$636	1	1	0%	0.164	$60	$25	$24	$0	$0	$744	$292	$482	$520	5.9	1,631.3	$1,226	$812
Land Fallow	Tulare	Range 11	19	$648	1	1	0%	0.164	$60	$25	$24	$0	$0	$757	$293	$482	$520	3.1	1,634.4	$1,239	$813

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Table 61
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ULTRAVIOLET RADIATION TREATMENT SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Option Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$776	$294	$482	$520	1.3	1,635.7	$1,258	$814
Land Fallow	Tulare	Range 12	36	$683	1	1	0%	0.164	$60	$25	$24	$0	$0	$792	$295	$482	$520	5.9	1,641.6	$1,274	$815
Land Fallow	Tulare	Range 13	19	$688	1	1	0%	0.164	$60	$25	$24	$0	$0	$797	$296	$482	$520	3.1	1,644.7	$1,279	$816
Land Fallow	San Joaquin	Range 9	21	$659	1	1	0%	0.164	$90	$25	$24	$0	$0	$798	$297	$482	$520	3.4	1,648.2	$1,280	$817
Land Fallow	San Joaquin	Range 10	13	$694	1	1	0%	0.164	$90	$25	$24	$0	$0	$833	$298	$482	$520	2.1	1,650.3	$1,315	$818
Land Fallow	Tulare	Range 14	19	$730	1	1	0%	0.164	$60	$25	$24	$0	$0	$839	$299	$482	$520	3.1	1,653.4	$1,321	$819
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$321	$482	$520	70.0	1,723.4	$1,332	$841
Land Fallow	San Joaquin	Range 11	21	$728	1	1	0%	0.164	$90	$25	$24	$0	$0	$867	$322	$482	$520	3.4	1,726.8	$1,349	$842
Land Fallow	San Joaquin	Range 12	13	$734	1	1	0%	0.164	$90	$25	$24	$0	$0	$873	$323	$482	$520	2.1	1,729.0	$1,355	$843
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$349	$482	$520	85.0	1,814.0	$1,362	$869
Land Fallow	Tulare	Range 15	19	$771	1	1	0%	0.164	$60	$25	$24	$0	$0	$880	$350	$482	$520	3.1	1,817.1	$1,362	$870
Land Fallow	San Joaquin	Range 13	13	$775	1	1	0%	0.164	$90	$25	$24	$0	$0	$914	$351	$482	$520	2.1	1,819.2	$1,396	$871
Land Fallow	San Joaquin	Range 14	13	$815	1	1	0%	0.164	$90	$25	$24	$0	$0	$954	$352	$482	$520	2.1	1,821.4	$1,436	$872
Land Fallow	Sacramento	Range 20	10	$866	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$971	$352	$482	$520	1.3	1,822.7	$1,453	$872
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$878	1	1	0%	0.164	$90	$0	$24	$0	$0	$990	$369	$482	$520	50.8	1,873.5	$1,472	$889
Land Fallow	San Joaquin	Range 15	13	$858	1	1	0%	0.164	$90	$25	$24	$0	$0	$995	$370	$482	$520	2.1	1,875.6	$1,477	$890
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$372	$482	$520	7.0	1,882.6	$1,487	$892
Ag WUE	Tulare	Increase efficiency, Range 3	5	$960	1	1	0%	0.164	$60	$25	$24	$0	$0	$1,059	$373	$482	$520	0.8	1,883.5	$1,541	$893
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist. develop	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$403	$482	$520	50.0	1,933.5	$2,012	$923
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	0%	0.164	$60	$25	$24	$0	$0	$1,609	$407	$482	$520	7.2	1,940.7	$2,091	$927
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	0%	0.164	$90	$25	$24	$0	$0	$1,639	$408	$482	$520	1.1	1,941.8	$2,121	$928
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$429	$482	$520	28.0	1,969.8	$2,362	$949
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	0%	0.16	$90	$25	$24	$0	$0	$2,014	$430	$482	$520	2.0	1,971.8	$2,496	$950

D-013658

D—013658

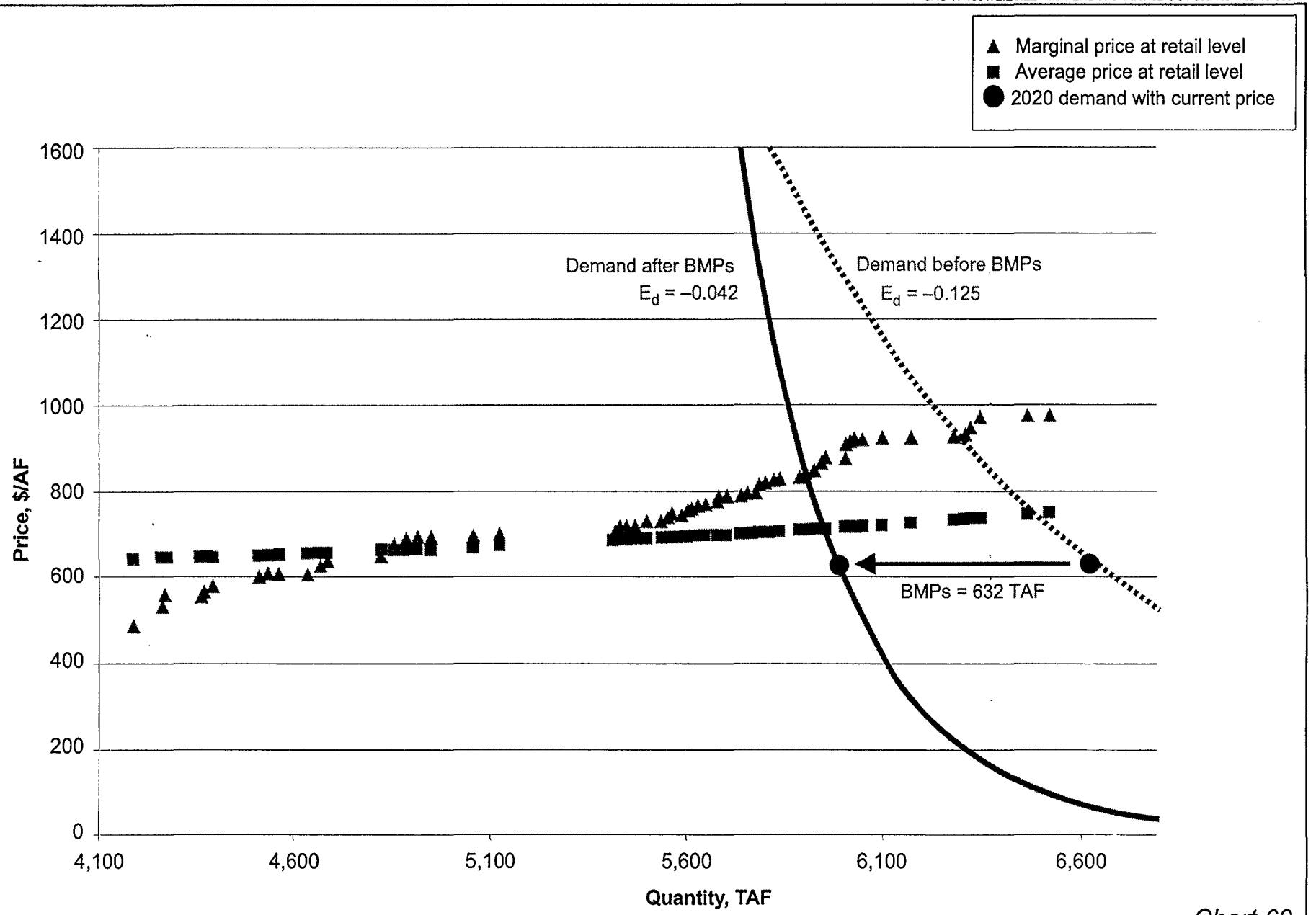

Chart 62
Screening Level Analysis
Ultraviolet Radiation Treatment Sensitivity Analysis
South Coast Region

D-013659

D-013659

Table 62
SUPPLY SCREENING LEVEL ANALYSIS, ULTRAVIOLET RADIATION TREATMENT SENSITIVITY ANALYSIS
SOUTH COAST REGION

Option			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Measure	Q_o Quantity (TAF/year)	C_o Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_c Transport Cost	C_T Transaction Fee, $/AF	C_d Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$142	$325	$500	24.0	4191.0	$486	$842
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$143	$325	$500	70.9	4,261.8	$531	$843
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$143	$325	$500	7.6	4,269.5	$554	$843
Urban WUE	South Coast	Reduce distribution system losses to E	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$145	$325	$500	91.6	4,361.0	$554	$845
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	0%	0.344	$110	$25	$24	$0	$0	$238	$145	$325	$500	2.6	4,363.6	$563	$845
Other	Delta	South Delta Improvements	65	$110	1.09	1	0%	0.344	$140	$0	$24	$0	$0	$251	$145	$325	$500	24.4	4,388.0	$576	$845
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$149	$325	$500	119.9	4,507.9	$600	$849
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$149	$325	$500	20.7	4,528.6	$605	$849
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$150	$325	$500	28.3	4,557.0	$605	$850
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$152	$325	$500	74.1	4,631.1	$605	$852
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.09	1	0%	0.601	$140	$0	$24	$0	$0	$299	$153	$325	$500	32.8	4,663.8	$624	$853
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	0%	0.344	$140	$25	$24	$0	$0	$311	$154	$325	$500	15.0	4,678.8	$636	$854
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$159	$325	$500	141.7	4,820.5	$646	$859
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	0%	0.601	$140	$25	$24	$0	$0	$345	$160	$325	$500	31.4	4,852.0	$670	$860
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	0%	0.601	$140	$25	$24	$0	$0	$357	$161	$325	$500	26.2	4,878.2	$682	$861
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield E:	9	$232	1.09	1	0%	0.601	$140	$0	$24	$0	$0	$363	$161	$325	$500	5.9	4,884.1	$688	$861
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$163	$325	$500	29.4	4,913.5	$692	$863
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$164	$325	$500	32.7	4,946.2	$692	$864
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$168	$325	$500	109.0	5,055.2	$692	$868
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	0%	0.601	$110	$25	$24	$0	$0	$375	$171	$325	$500	65.5	5,120.7	$700	$871
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.09	1	0%	0.601	$140	$0	$24	$0	$0	$376	$182	$325	$500	294.8	5,415.5	$701	$882
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$379	$182	$325	$500	9.4	5,424.9	$704	$882
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$386	$183	$325	$500	6.3	5,431.2	$711	$883
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$388	$183	$325	$500	17.5	5,448.7	$713	$883
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$389	$184	$325	$500	20.0	5,468.7	$714	$884
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$403	$185	$325	$500	31.3	5,500.0	$728	$885
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$403	$187	$325	$500	37.6	5,537.6	$728	$887
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$409	$187	$325	$500	17.5	5,555.1	$734	$887
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$188	$325	$500	10.9	5,566.0	$738	$888
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$414	$189	$325	$500	20.0	5,586.1	$739	$889
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$420	$189	$325	$500	15.8	5,601.8	$745	$889
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$429	$190	$325	$500	9.4	5,611.2	$754	$890
Land Fallow	Sacramento	Range 7	28	$228	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$435	$191	$325	$500	17.5	5,628.7	$760	$891
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$440	$191	$325	$500	20.0	5,648.8	$765	$891
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$449	$193	$325	$500	31.3	5,680.1	$774	$893
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$458	$193	$325	$500	6.3	5,686.4	$783	$893
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$458	$194	$325	$500	15.8	5,702.2	$783	$894
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$460	$196	$325	$500	37.6	5,739.7	$785	$896
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$463	$196	$325	$500	17.5	5,757.3	$788	$896
Land Fallow	Sacramento	Range 12	32	$256	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$467	$197	$325	$500	20.0	5,777.3	$792	$897
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$482	$198	$325	$500	9.4	5,786.7	$807	$898
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$489	$199	$325	$500	17.5	5,804.2	$814	$899
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$493	$200	$325	$500	20.0	5,824.3	$818	$700
Land Fallow	Sacramento	Range 15	25	$283	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$498	$201	$325	$500	15.7	5,839.9	$823	$701
Land Fallow	Tulare	Range 1	67	$387	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$501	$203	$325	$500	52.4	5,892.4	$826	$703
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	0%	0.229	$140	$25	$24	$0	$0	$517	$204	$325	$500	12.0	5,904.3	$842	$704
Additional options to the right of the demand function (after BMPs)																					
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	0%	0.489	$140	$25	$24	$0	$0	$517	$205	$325	$500	25.6	5,929.9	$842	$705
Land Fallow	Sacramento	Range 16	25	$317	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$537	$206	$325	$500	15.8	5,945.7	$862	$706
Land Fallow	San Joaquin	Range 4	12	$406	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$545	$207	$325	$500	9.4	5,955.1	$870	$707
Land Fallow	Tulare	Range 2	67	$438	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$547	$210	$325	$500	52.4	6,007.5	$872	$710
Land Fallow	Sacramento	Range 17	10	$355	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$580	$210	$325	$500	6.3	6,013.8	$905	$710
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$582	$210	$325	$500	3.9	6,017.7	$907	$710
Land Fallow	Sacramento	Range 18	25	$362	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$588	$211	$325	$500	15.7	6,033.3	$913	$711
Land Fallow	San Joaquin	Range 5	21	$452	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$588	$212	$325	$500	16.4	6,049.8	$913	$712
Land Fallow	Tulare	Range 3	67	$490	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$595	$216	$325	$500	52.4	6,102.2	$920	$716
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new de	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$220	$325	$500	73.0	6,175.2	$921	$720
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$227	$325	$500	109.0	6,284.2	$921	$727
Land Fallow	Tulare	Range 4	36	$492	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$597	$228	$325	$500	28.2	6,312.4	$922	$728
Land Fallow	San Joaquin	Range 6	12	$483	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$616	$229	$325	$500	9.4	6,321.8	$941	$729
Land Fallow	Tulare	Range 5	36	$540	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$642	$231	$325	$500	28.2	6,350.0	$967	$731
Urban WUE	South Coast	Reduce indoor water use from 60 to 5	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$238	$325	$500	119.9	6,469.9	$967	$736
Land Fallow	Tulare	Range 6	67	$542	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$643	$241	$325	$500	52.4	6,522.3	$968	$741

D-013660

D—013660

Table 62
SUPPLY SCREENING LEVEL ANALYSIS, ULTRAVIOLET RADIATION TREATMENT SENSITIVITY ANALYSIS
SOUTH COAST REGION

Option			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Measure	Q_o Quantity (TAF/year)	C_o Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_e Transport Cost	C_T Transaction Fee, $/AF	C_q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_B Marginal Cost at Retail	P_D Average Cost at Retail
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	San Joaquin	Range 7	21	$522	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$652	$243	$325	$500	16.4	6,538.7	$977	$743
Land Fallow	Tulare	Range 7	36	$588	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$686	$244	$325	$500	28.2	6,566.9	$1,011	$744
Land Fallow	Tulare	Range 8	67	$594	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$690	$248	$325	$500	52.4	6,619.4	$1,015	$748
Land Fallow	Tulare	Range 9	19	$607	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$703	$249	$325	$500	14.9	6,634.2	$1,028	$749
Land Fallow	San Joaquin	Range 8	21	$590	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$714	$250	$325	$500	16.4	6,650.7	$1,039	$750
Land Fallow	Tulare	Range 10	36	$635	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$728	$252	$325	$500	28.2	6,678.8	$1,053	$752
Land Fallow	Tulare	Range 11	19	$648	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$741	$253	$325	$500	14.9	6,693.7	$1,066	$753
Land Fallow	Sacramento	Range 19	10	$510	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$758	$254	$325	$500	6.3	6,700.0	$1,083	$754
Land Fallow	Tulare	Range 12	36	$683	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$772	$256	$325	$500	28.2	6,728.1	$1,097	$756
Land Fallow	Tulare	Range 13	19	$688	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$777	$257	$325	$500	14.9	6,743.0	$1,102	$757
Land Fallow	San Joaquin	Range 9	21	$659	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$778	$258	$325	$500	16.4	6,759.4	$1,103	$758
Land Fallow	San Joaquin	Range 10	13	$694	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$810	$259	$325	$500	10.2	6,769.6	$1,135	$759
Land Fallow	Tulare	Range 14	19	$730	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$815	$260	$325	$500	14.9	6,784.5	$1,140	$760
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$289	$325	$500	359.7	7,144.2	$1,151	$789
Land Fallow	San Joaquin	Range 11	21	$726	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$842	$290	$325	$500	16.4	7,160.6	$1,167	$790
Land Fallow	San Joaquin	Range 12	13	$734	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$847	$291	$325	$500	10.2	7,170.8	$1,172	$791
Land Fallow	Tulare	Range 15	19	$771	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$853	$292	$325	$500	14.9	7,185.7	$1,178	$792
Land Fallow	San Joaquin	Range 13	13	$775	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$884	$293	$325	$500	10.2	7,195.8	$1,209	$793
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$302	$325	$500	109.0	7,304.8	$1,242	$802
Land Fallow	San Joaquin	Range 14	13	$815	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$921	$303	$325	$500	10.2	7,315.0	$1,246	$803
Land Fallow	Sacramento	Range 20	10	$866	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$937	$304	$325	$500	6.3	7,321.3	$1,262	$804
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$305	$325	$500	20.7	7,342.0	$1,265	$805
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.09	1	0%	0.718	$140	$0	$24	$0	$0	$954	$326	$325	$500	242.6	7,584.6	$1,279	$826
Land Fallow	San Joaquin	Range 15	13	$856	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$959	$327	$325	$500	10.2	7,594.8	$1,284	$827
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$1,017	$327	$325	$500	3.9	7,598.7	$1,342	$827
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$330	$325	$500	20.7	7,619.4	$1,609	$830
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$343	$325	$500	109.0	7,728.4	$1,609	$843
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$398	$325	$500	474.2	8,202.5	$1,609	$898
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. c	179	$1,850	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$422	$325	$500	195.1	8,397.7	$1,747	$922
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$1,522	$426	$325	$500	34.4	8,432.1	$1,847	$926
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$1,550	$427	$325	$500	5.5	8,437.6	$1,875	$927
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$440	$325	$500	88.3	8,525.9	$2,068	$940
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$1,894	$442	$325	$500	9.4	8,535.2	$2,219	$942

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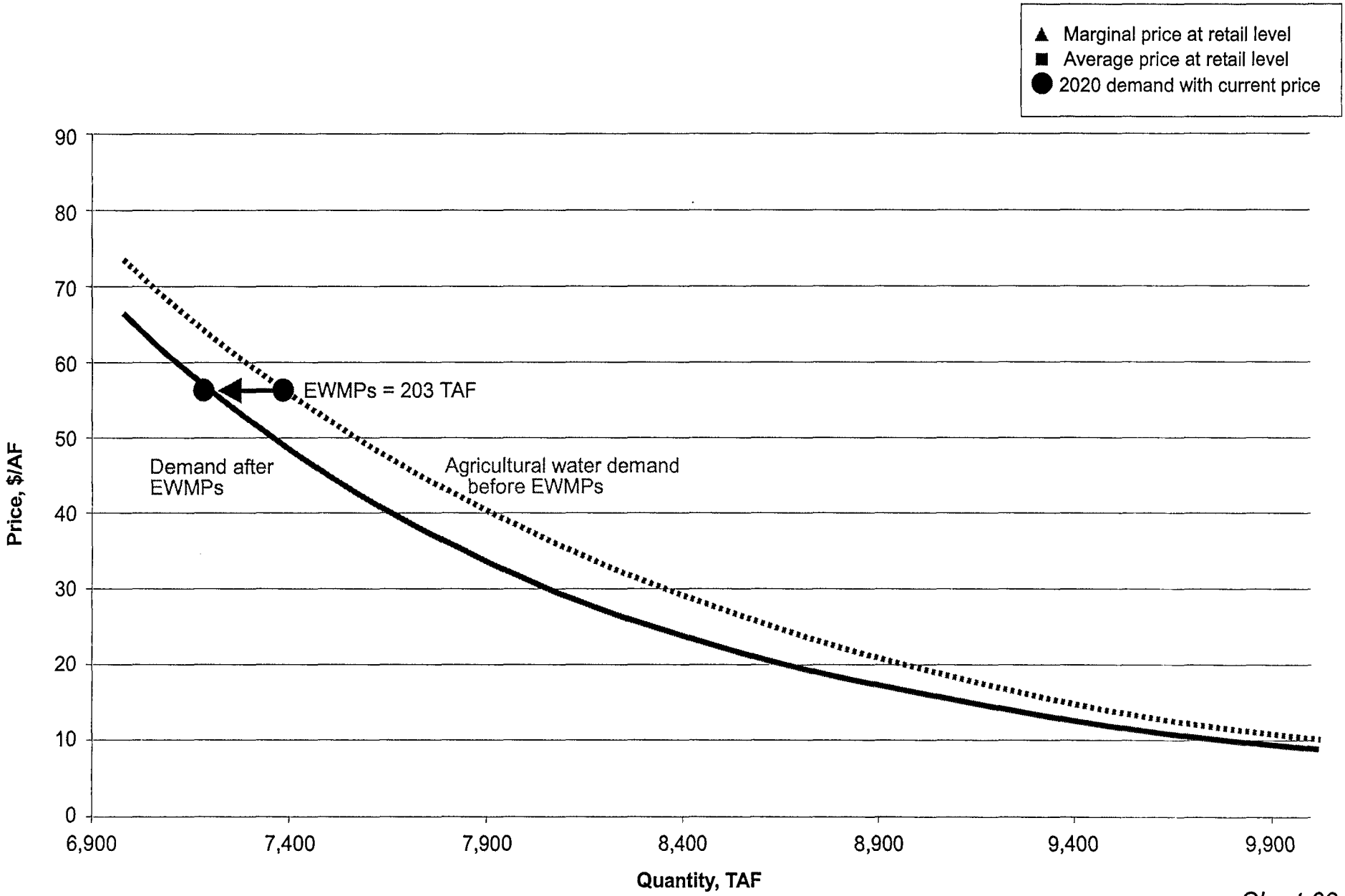

Chart 63

Screening Level Analysis
Ultraviolet Radiation Treatment Sensitivity Analysis
Sacramento River Region

D-013662

Table 63

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ULTRAVIOLET RADIATION TREATMENT SENSITIVITY ANALYSIS
SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination				
													Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

Options screened to meet demand

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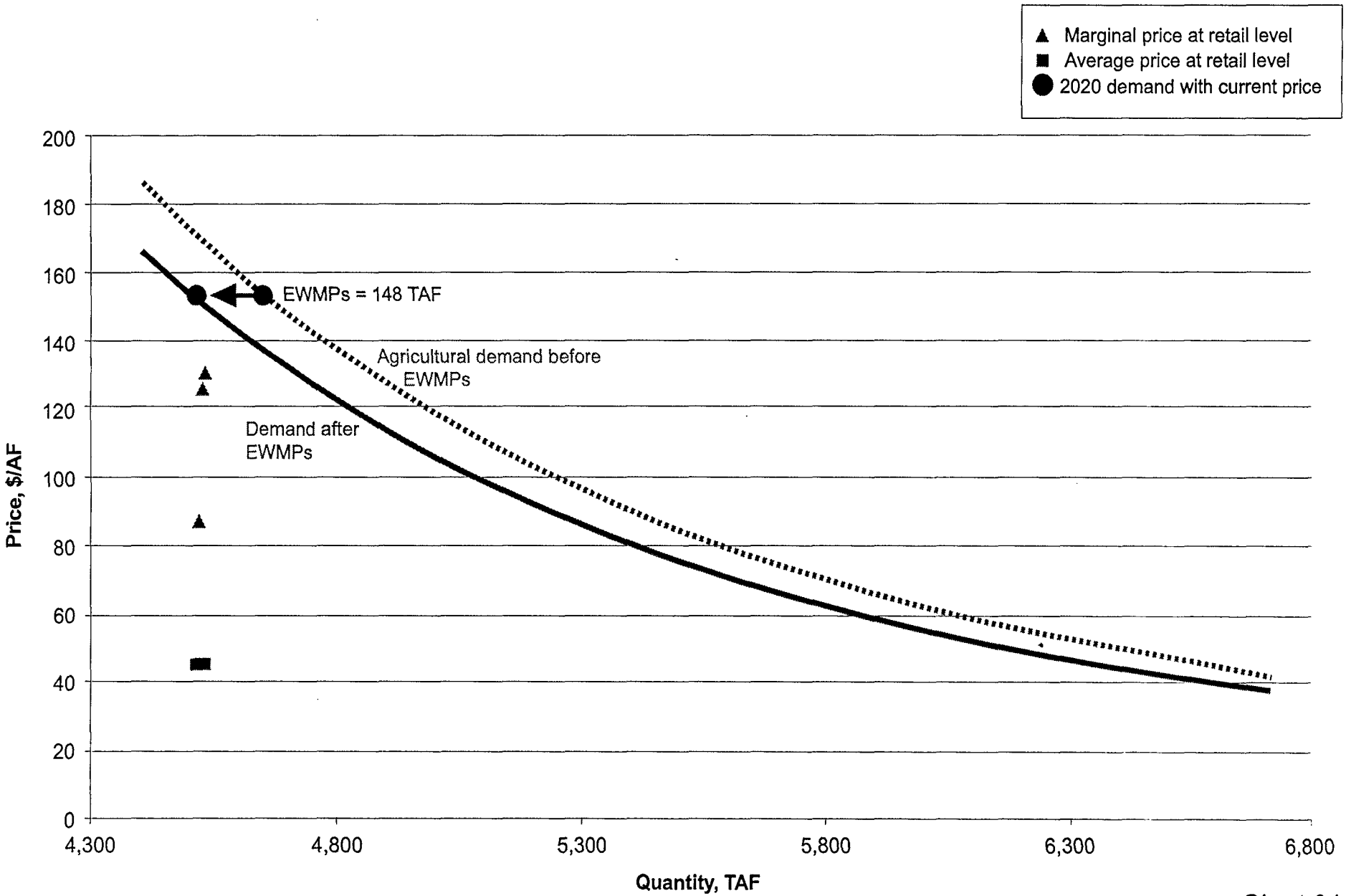

Chart 64

Screening Level Analysis
Ultraviolet Radiation Treatment Sensitivity Analysis
San Joaquin River Region

D-013664

D-013664

Table 64

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ULTRAVIOLET RADIATION TREATMENT SENSITIVITY ANALYSIS
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
										At Farm			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	South Delta Improvements	65	$110	1.15	1	0.106	$30	$0	7.9	$126	4,527	$126	$45.15
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.106	$0	$0	4.9	$130	4,532	$130	$45.24

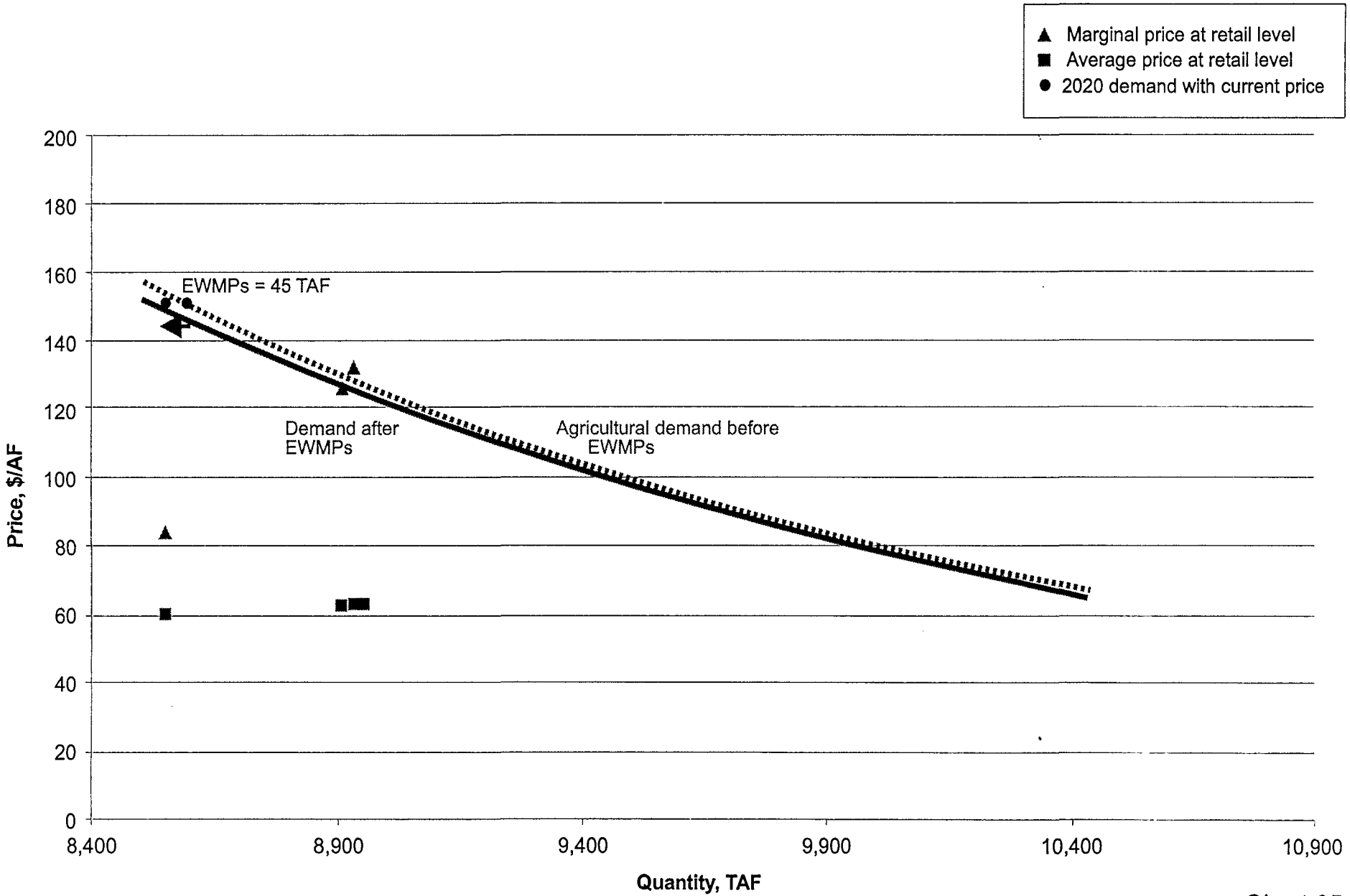

Chart 65

Screening Level Analysis
Ultraviolet Radiation Treatment Sensitivity Analysis
Tulare Lake Region

D-013666

Table 65

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, ULTRAVIOLET RADIATION TREATMENT SENSITIVITY ANALYSIS
TULARE LAKE REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Destination: At Farm Dry Q (TAF/year)	At Destination: At Farm Dry P ($/AF)	At Destination: Cumulative Quantity (TAF/year)	At Destination: Retail Price Using: P_D Marginal Cost at Retail	At Destination: Retail Price Using: P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,907	$126	$62.65
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,932	$132	$62.85
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0.322	$60	$25	15.3	$211	8,947	$211	$63.10

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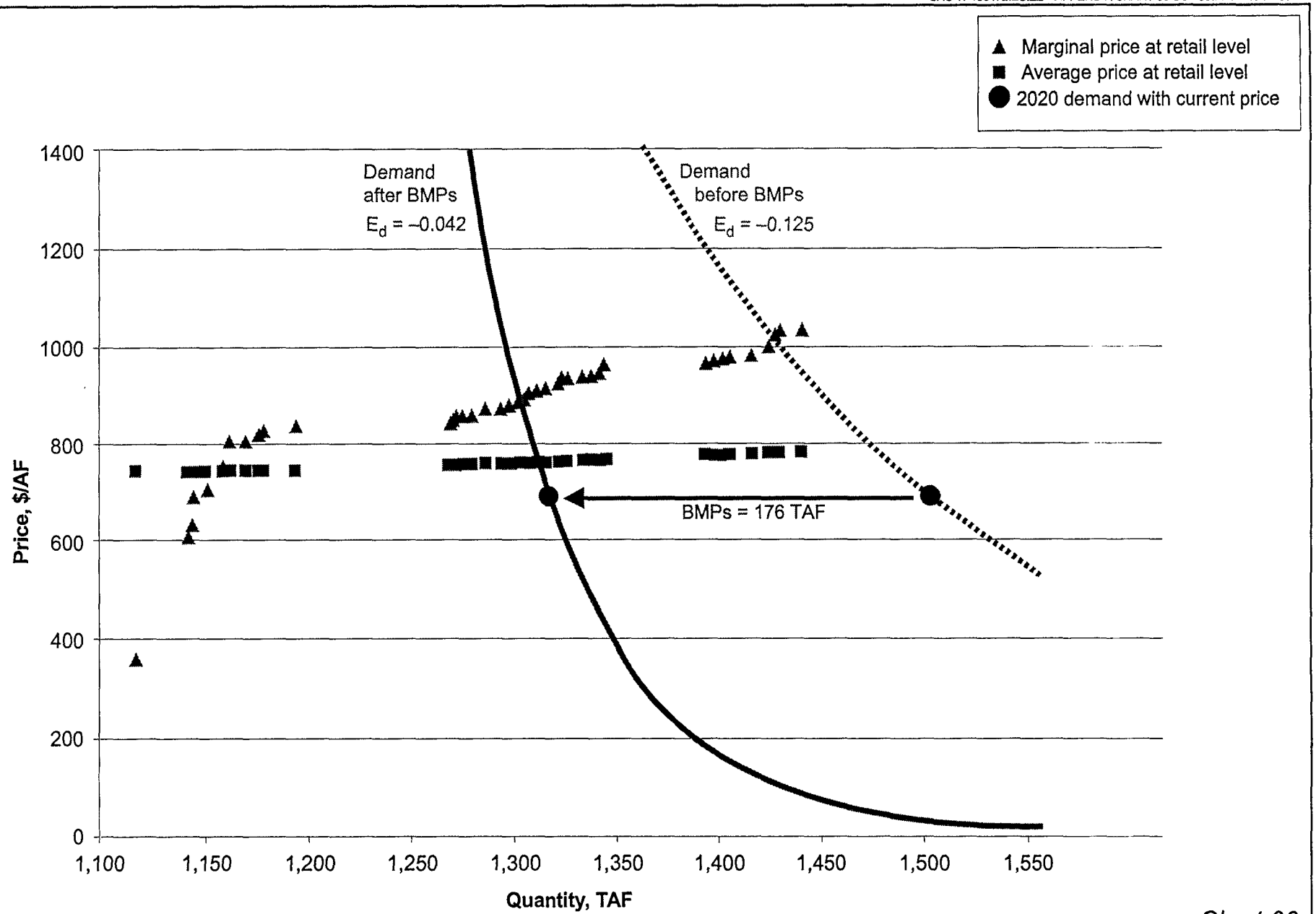

Chart 66

Screening Level Analysis
Urban Delta Exporters Preference Set With Isolated Facility Sensitivity Analysis
San Francisco Bay Region

D-013668

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Table 66

SCREENING LEVEL ANALYSIS, URBAN DELTA EXPORTERS PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

Option			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$226	$482	$520	25.0	1118.0	$362	$746
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$224	$482	$520	25.0	1,143.0	$612	$744
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$224	$482	$520	2.0	1,145.0	$632	$744
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	0%	0.094	$60	$25	$24	$0	$0	$209	$224	$482	$520	0.7	1,145.7	$691	$744
Other	Delta	South Delta improvements	65	$110	1	1	0%	0.094	$90	$0	$24	$0	$0	$224	$224	$482	$520	6.1	1,151.8	$706	$744
Surface Storage	Sacramento	Sac. River Onstream High Yield	50	$182	1	1	0%	0.164	$90	$0	$24	$0	$0	$276	$225	$482	$520	8.2	1,160.0	$758	$745
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	0%	0.094	$90	$25	$24	$0	$0	$327	$225	$482	$520	3.0	1,163.0	$809	$745
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$327	$226	$482	$520	7.9	1,170.8	$809	$746
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	0%	0.164	$90	$25	$24	$0	$0	$339	$226	$482	$520	6.6	1,177.4	$821	$746
Surface Storage	San Joaquin	S. Joaq. River Offstream High Y	9	$232	1	1	0%	0.164	$90	$0	$24	$0	$0	$348	$226	$482	$520	1.5	1,178.9	$828	$746
Active Conj. Use	Tulare	Project 1	100	$250	1	1	0%	0.164	$60	$25	$24	$0	$0	$359	$228	$482	$520	16.4	1,195.3	$841	$748
Surface Storage	Sacramento	Sac. River Offstream High Yield	450	$246	1	1	0%	0.164	$90	$0	$24	$0	$0	$360	$236	$482	$520	73.8	1,269.1	$842	$756
Land Fallow	San Joaquin	Range 1	12	$224	1	1	0%	0.164	$90	$25	$24	$0	$0	$363	$236	$482	$520	2.0	1,271.1	$845	$756
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$371	$236	$482	$520	1.3	1,272.4	$853	$756
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$372	$237	$482	$520	3.7	1,276.0	$854	$757
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$374	$237	$482	$520	4.2	1,280.2	$856	$757
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	0%	0.164	$90	$25	$24	$0	$0	$389	$238	$482	$520	6.6	1,286.8	$871	$758
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$389	$239	$482	$520	7.9	1,294.7	$871	$759
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$396	$239	$482	$520	3.7	1,298.3	$878	$759
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$401	$240	$482	$520	4.2	1,302.5	$883	$760
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$407	$240	$482	$520	3.3	1,305.8	$889	$760
Land Fallow	San Joaquin	Range 2	12	$279	1	1	0%	0.164	$90	$25	$24	$0	$0	$418	$240	$482	$520	2.0	1,307.8	$900	$760
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$424	$241	$482	$520	3.7	1,311.5	$906	$761
Additional options to the right of the demand function (after BMPs)																					
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$429	$241	$482	$520	4.2	1,315.7	$911	$761
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	0%	0.164	$90	$25	$24	$0	$0	$439	$242	$482	$520	6.6	1,322.2	$921	$762
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$449	$243	$482	$520	1.3	1,323.6	$931	$763
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$449	$243	$482	$520	3.3	1,326.9	$931	$763
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$452	$244	$482	$520	7.9	1,334.7	$934	$764
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$454	$245	$482	$520	3.7	1,338.4	$936	$765
Land Fallow	Sacramento	Range 12	32	$258	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$459	$246	$482	$520	4.2	1,342.6	$941	$766
Land Fallow	San Joaquin	Range 3	12	$336	1	1	0%	0.164	$90	$25	$24	$0	$0	$475	$248	$482	$520	2.0	1,344.6	$957	$766
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$254	$482	$520	50.0	1,394.6	$962	$774
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$483	$255	$482	$520	3.7	1,398.3	$965	$775
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$488	$256	$482	$520	4.2	1,402.5	$970	$776
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$493	$258	$482	$520	3.3	1,405.7	$975	$776
Land Fallow	Tulare	Range 1	67	$387	1	1	0%	0.164	$60	$25	$24	$0	$0	$496	$258	$482	$520	11.0	1,416.7	$978	$778
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$514	$259	$482	$520	7.9	1,424.6	$996	$779
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$536	$260	$482	$520	3.3	1,427.9	$1,018	$780
Land Fallow	San Joaquin	Range 4	12	$406	1	1	0%	0.164	$90	$25	$24	$0	$0	$545	$260	$482	$520	2.0	1,429.9	$1,027	$780
Land Fallow	Tulare	Range 2	67	$438	1	1	0%	0.164	$60	$25	$24	$0	$0	$547	$263	$482	$520	11.0	1,440.9	$1,029	$783
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 17	10	$355	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$583	$263	$482	$520	1.3	1,442.2	$1,065	$783
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	0%	0.164	$60	$25	$24	$0	$0	$584	$263	$482	$520	0.8	1,443.0	$1,066	$783
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$591	$264	$482	$520	3.3	1,446.3	$1,073	$784
Land Fallow	San Joaquin	Range 5	21	$452	1	1	0%	0.164	$90	$25	$24	$0	$0	$591	$265	$482	$520	3.4	1,449.7	$1,073	$785
Land Fallow	Tulare	Range 3	67	$490	1	1	0%	0.164	$60	$25	$24	$0	$0	$599	$267	$482	$520	11.0	1,460.7	$1,081	$787
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	1	$0	$0	$0	$0	$0	$600	$269	$482	$520	10.0	1,470.7	$1,082	$789
Land Fallow	Tulare	Range 4	36	$492	1	1	0%	0.164	$60	$25	$24	$0	$0	$601	$271	$482	$520	5.9	1,476.6	$1,083	$791
Land Fallow	San Joaquin	Range 6	12	$483	1	1	0%	0.164	$90	$25	$24	$0	$0	$622	$271	$482	$520	2.0	1,478.6	$1,104	$791
Land Fallow	Tulare	Range 5	36	$540	1	1	0%	0.164	$60	$25	$24	$0	$0	$649	$273	$482	$520	5.9	1,484.5	$1,131	$793
Land Fallow	Tulare	Range 6	67	$542	1	1	0%	0.164	$60	$25	$24	$0	$0	$651	$276	$482	$520	11.0	1,495.5	$1,133	$796
Land Fallow	San Joaquin	Range 7	21	$522	1	1	0%	0.164	$90	$25	$24	$0	$0	$661	$276	$482	$520	3.4	1,498.9	$1,143	$796
Land Fallow	Tulare	Range 7	36	$588	1	1	0%	0.164	$60	$25	$24	$0	$0	$697	$278	$482	$520	5.9	1,504.8	$1,179	$798
Land Fallow	Tulare	Range 8	67	$594	1	1	0%	0.164	$60	$25	$24	$0	$0	$703	$281	$482	$520	11.0	1,515.8	$1,185	$801
Land Fallow	Tulare	Range 9	19	$607	1	1	0%	0.164	$60	$25	$24	$0	$0	$716	$282	$482	$520	3.1	1,518.9	$1,198	$802
Land Fallow	San Joaquin	Range 8	21	$590	1	1	0%	0.164	$90	$25	$24	$0	$0	$729	$283	$482	$520	3.4	1,522.4	$1,211	$803
Land Fallow	Tulare	Range 10	36	$635	1	1	0%	0.164	$60	$25	$24	$0	$0	$744	$285	$482	$520	5.9	1,528.3	$1,226	$805
Land Fallow	Tulare	Range 11	19	$648	1	1	0%	0.164	$60	$25	$24	$0	$0	$757	$286	$482	$520	3.1	1,531.4	$1,239	$806
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$776	$286	$482	$520	1.3	1,532.7	$1,258	$806
Land Fallow	Tulare	Range 12	36	$683	1	1	0%	0.164	$60	$25	$24	$0	$0	$792	$288	$482	$520	5.9	1,538.6	$1,274	$808
Land Fallow	Tulare	Range 13	19	$688	1	1	0%	0.164	$60	$25	$24	$0	$0	$797	$289	$482	$520	3.1	1,541.7	$1,279	$809
Land Fallow	San Joaquin	Range 9	21	$659	1	1	0%	0.164	$90	$25	$24	$0	$0	$798	$290	$482	$520	3.4	1,545.2	$1,280	$810
Land Fallow	San Joaquin	Range 10	13	$894	1	1	0%	0.164	$90	$25	$24	$0	$0	$833	$291	$482	$520	2.1	1,547.3	$1,315	$811
Land Fallow	Tulare	Range 14	19	$730	1	1	0%	0.164	$60	$25	$24	$0	$0	$839	$292	$482	$520	3.1	1,550.4	$1,321	$812
Other	S.F. Bay	American River	70	$860	1	1	0%	1	$0	$0	$0	$0	$0	$850	$316	$482	$520	70.0	1,620.4	$1,332	$836

D-013669

D—013669

Table 66

SCREENING LEVEL ANALYSIS, URBAN DELTA EXPORTERS PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

Option			At Source (dry condition)		F_R	F_D	F_B	F_A			C_D	C_R	C_W	Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
			Q_O	C_O	Reapplication	Delta	MT Brine	Share of	C_C	C_T	Delta	Water Use Efficiency	Wastewater	Marginal	Average	P_M Marginal	P_M Average	Q_D		P_D Marginal	P_D Average
Type	Location	Measure	Quantity (TAF/year)	Unit Cost ($/AF)	Factor	Loss Factor	Loss Factor	New Supply Factor	Transport Cost	Transaction Fee, $/AF	Water Quality Cost, $/AF	& Recycling Avoided Cost, $/AF	Discharge Avoided Cost, $/AF	Unit Cost, $/AF	Unit Cost, $/AF	Unit Cost $/AF	Unit Cost $/AF	Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	Cost at Retail	Cost at Retail
Land Fallow	San Joaquin	Range 11	21	$728	1	1	0%	0.164	$90	$25	$24	$0	$0	$867	$317	$482	$520	3.4	1,623.8	$1,349	$837
Land Fallow	San Joaquin	Range 12	13	$734	1	1	0%	0.164	$90	$25	$24	$0	$0	$873	$318	$482	$520	2.1	1,626.0	$1,355	$838
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$348	$482	$520	85.0	1,711.0	$1,362	$866
Land Fallow	Tulare	Range 15	19	$771	1	1	0%	0.164	$60	$25	$24	$0	$0	$880	$347	$482	$520	3.1	1,714.1	$1,362	$867
Land Fallow	San Joaquin	Range 13	13	$775	1	1	0%	0.164	$90	$25	$24	$0	$0	$914	$348	$482	$520	2.1	1,716.2	$1,396	$868
Land Fallow	San Joaquin	Range 14	13	$815	1	1	0%	0.164	$90	$25	$24	$0	$0	$954	$348	$482	$520	2.1	1,718.4	$1,436	$868
Land Fallow	Sacramento	Range 20	10	$866	1	0.8	0%	0.164	$90	$25	$24	$0	$0	$971	$349	$482	$520	1.3	1,719.7	$1,453	$869
Surface Storage	San Joaquin	Aqueduct Offstream High Yield	310	$876	1	1	0%	0.164	$90	$0	$24	$0	$0	$990	$367	$482	$520	50.8	1,770.5	$1,472	$887
Land Fallow	San Joaquin	Range 16	13	$856	1	1	0%	0.164	$90	$25	$24	$0	$0	$995	$368	$482	$520	2.1	1,772.6	$1,477	$888
Urban WUE	S.F. Bay	Reduce indoor CII use from 3%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$371	$482	$520	7.0	1,779.6	$1,487	$891
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1	1	0%	0.164	$60	$25	$24	$0	$0	$1,059	$371	$482	$520	0.8	1,780.5	$1,541	$891
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	0%	0.164	$60	$25	$24	$0	$0	$1,609	$376	$482	$520	7.2	1,787.7	$2,091	$896
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	0%	0.164	$90	$25	$24	$0	$0	$1,639	$377	$482	$520	1.1	1,788.8	$2,121	$897
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	0%	0.16	$90	$25	$24	$0	$0	$2,014	$379	$482	$520	2.0	1,790.8	$2,496	$899

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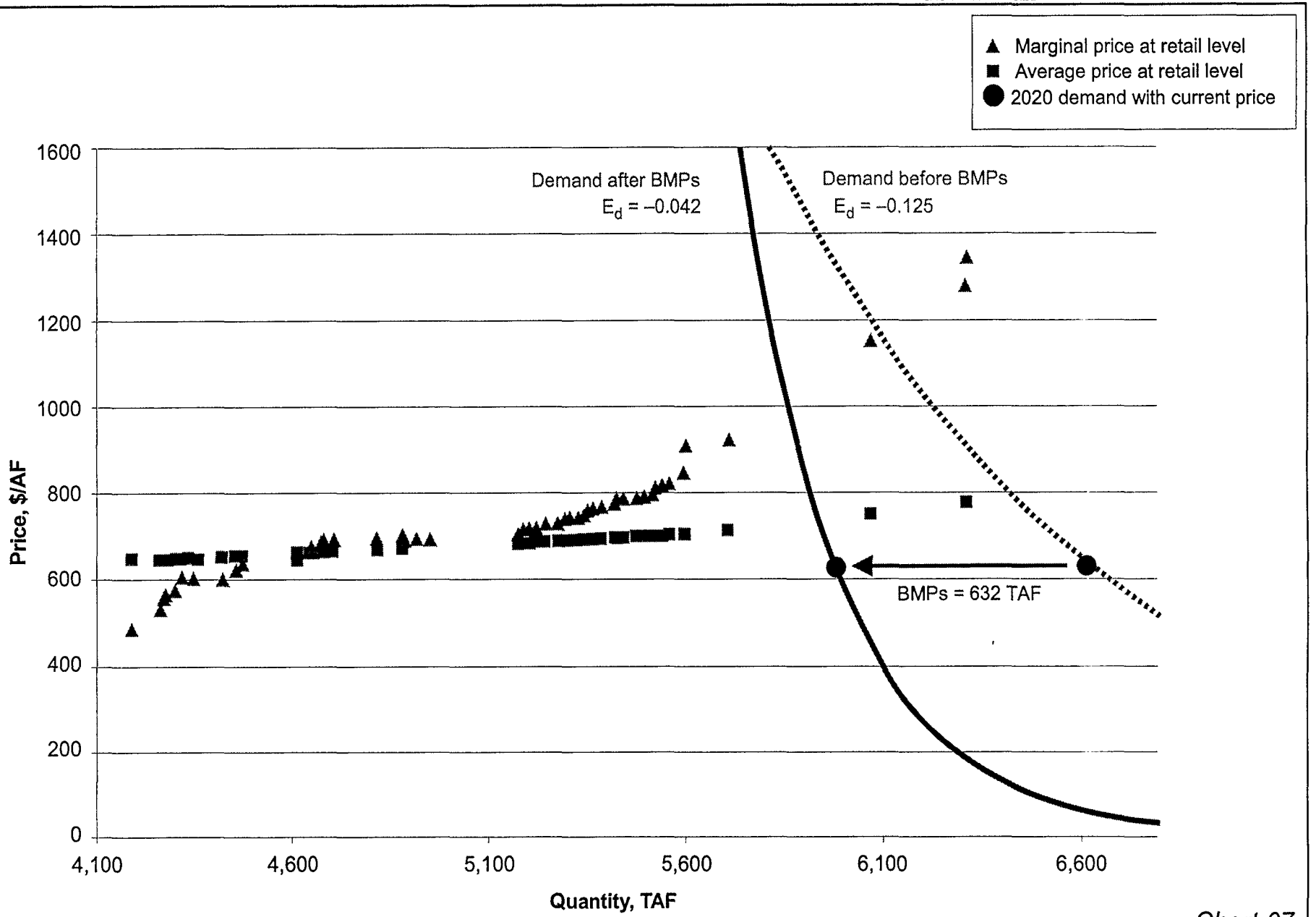

Chart 67

Screening Level Analysis
Urban Delta Exporters Preference Set With Isolated Facility Sensitivity Analysis
South Coast Region

D-013671

D—013671

Table 67
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DELTA EXPORTERS PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			828																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$145	$325	$500	24.0	4191.0	$486	$645
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$208	$146	$325	$500	70.9	4,261.8	$531	$646
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$147	$325	$500	7.6	4,269.5	$554	$647
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	0%	0.344	$110	$25	$24	$0	$0	$238	$147	$325	$500	2.6	4,272.1	$563	$647
Other	Delta	South Delta Improvements	65	$110	1.09	1	0%	0.344	$140	$0	$24	$0	$0	$251	$147	$325	$500	24.4	4,296.5	$576	$647
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$148	$325	$500	20.7	4,317.2	$605	$648
Other	Color. River	Coachella Canal lining	28	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$149	$325	$500	28.3	4,345.5	$605	$649
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$151	$325	$500	74.1	4,419.6	$605	$651
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$182	1.09	1	0%	0.601	$140	$0	$24	$0	$0	$299	$152	$325	$500	32.8	4,452.4	$624	$652
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	0%	0.344	$140	$25	$24	$0	$0	$311	$153	$325	$500	15.0	4,467.4	$636	$653
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$158	$325	$500	141.7	4,609.1	$648	$658
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	0%	0.601	$140	$25	$24	$0	$0	$345	$159	$325	$500	31.4	4,640.5	$670	$659
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	0%	0.601	$140	$25	$24	$0	$0	$367	$160	$325	$500	26.2	4,666.7	$682	$660
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.09	1	0%	0.601	$140	$0	$24	$0	$0	$363	$160	$325	$500	5.9	4,672.6	$688	$660
Other	South Coast	Desalination Range 1	27	$600	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$162	$325	$500	29.4	4,702.1	$692	$662
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$166	$325	$500	109.0	4,811.1	$692	$666
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	0%	0.601	$110	$25	$24	$0	$0	$375	$169	$325	$500	85.5	4,876.6	$700	$669
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1.09	1	0%	0.601	$140	$0	$24	$0	$0	$376	$181	$325	$500	294.8	5,171.4	$701	$681
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	0%	0.601	$140	$25	$24	$0	$0	$379	$181	$325	$500	7.9	5,179.2	$704	$681
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	0%	0.601	$140	$25	$24	$0	$0	$386	$181	$325	$500	5.2	5,184.5	$711	$681
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	0%	0.601	$140	$25	$24	$0	$0	$388	$182	$325	$500	14.7	5,199.1	$713	$682
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	0%	0.601	$140	$25	$24	$0	$0	$389	$183	$325	$500	16.8	5,215.9	$714	$683
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	0%	0.601	$140	$25	$24	$0	$0	$403	$184	$325	$500	26.2	5,242.1	$728	$684
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	0%	0.601	$140	$25	$24	$0	$0	$403	$185	$325	$500	31.4	5,273.5	$728	$685
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$409	$186	$325	$500	17.5	5,291.1	$734	$686
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$186	$325	$500	10.9	5,302.0	$738	$686
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$414	$187	$325	$500	20.0	5,322.0	$739	$687
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$420	$188	$325	$500	15.8	5,337.8	$745	$688
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$429	$188	$325	$500	9.4	5,347.2	$754	$688
Land Fallow	Sacramento	Range 7	28	$228	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$435	$189	$325	$500	17.5	5,364.7	$760	$689
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$440	$190	$325	$500	20.0	5,384.7	$765	$690
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$449	$192	$325	$500	31.3	5,416.0	$774	$692
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$458	$192	$325	$500	6.3	5,422.4	$783	$692
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$458	$193	$325	$500	15.8	5,438.1	$783	$693
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$460	$194	$325	$500	37.6	5,475.7	$785	$694
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$463	$195	$325	$500	17.5	5,493.2	$788	$695
Land Fallow	Sacramento	Range 12	32	$258	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$467	$196	$325	$500	20.0	5,513.3	$792	$696
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$482	$197	$325	$500	9.4	5,522.6	$807	$697
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$489	$198	$325	$500	17.5	5,540.2	$814	$698
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$493	$199	$325	$500	20.0	5,560.2	$818	$699
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$517	$201	$325	$500	37.8	5,597.8	$842	$701
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$582	$201	$325	$500	3.9	5,601.7	$907	$701
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$209	$325	$500	109.0	5,710.7	$921	$709
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	0.635	$0	$0	$0	-$100	$0	$826	$232	$325	$500	228.4	5,939.1	$1,151	$732
Additional options to the right of the demand function (after BMPs)																					
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	0.365	$0	$0	$0	-$100	$0	$826	$245	$325	$500	131.3	6,070.4	$1,151	$745
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.09	1	0%	0.718	$140	$0	$24	$0	$0	$954	$272	$325	$500	242.6	6,313.0	$1,279	$772
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$1,017	$273	$325	$500	3.9	6,316.9	$1,342	$773
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$276	$325	$500	20.7	6,337.6	$1,609	$776
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	0%	0.718	$110	$25	$24	$0	$0	$1,522	$283	$325	$500	34.4	6,372.1	$1,847	$783
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	0%	0.718	$140	$25	$24	$0	$0	$1,550	$284	$325	$500	5.5	6,377.5	$1,875	$784
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	0%	0.718	$140	$25	$24	$0	$0	$1,894	$286	$325	$500	9.4	6,386.9	$2,219	$786

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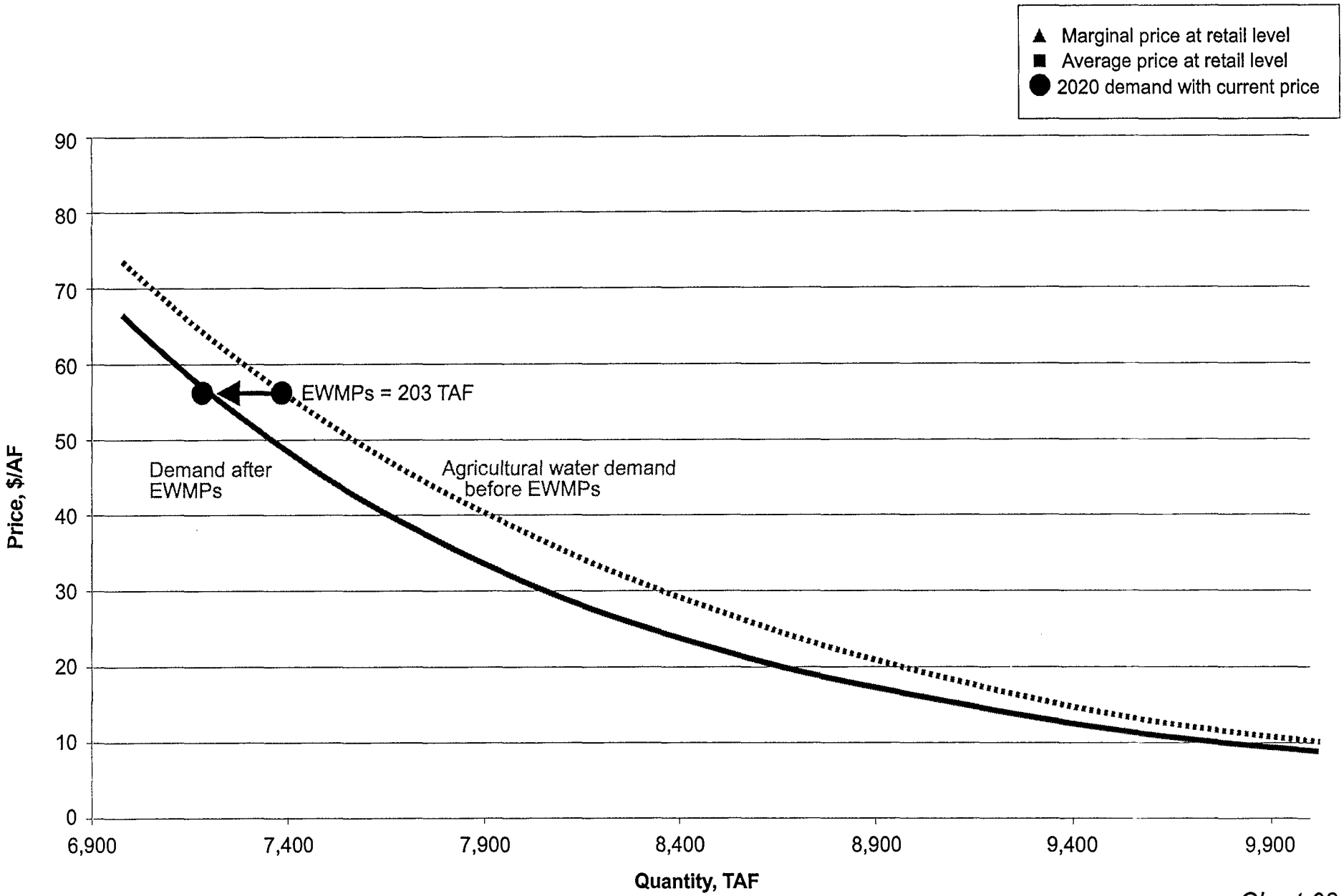

Chart 68

Screening Level Analysis
Urban Delta Exporters Preference Set With Isolated Facility Sensitivity Analysis
Sacramento River Region

D-013673

Table 68

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DELTA EXPORTERS PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS SACRAMENTO RIVER REGION

Option			At Source (dry condition)							At Destination				
										At Farm			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Sacramento	EWMPs	12(203)											

Options screened to meet demand

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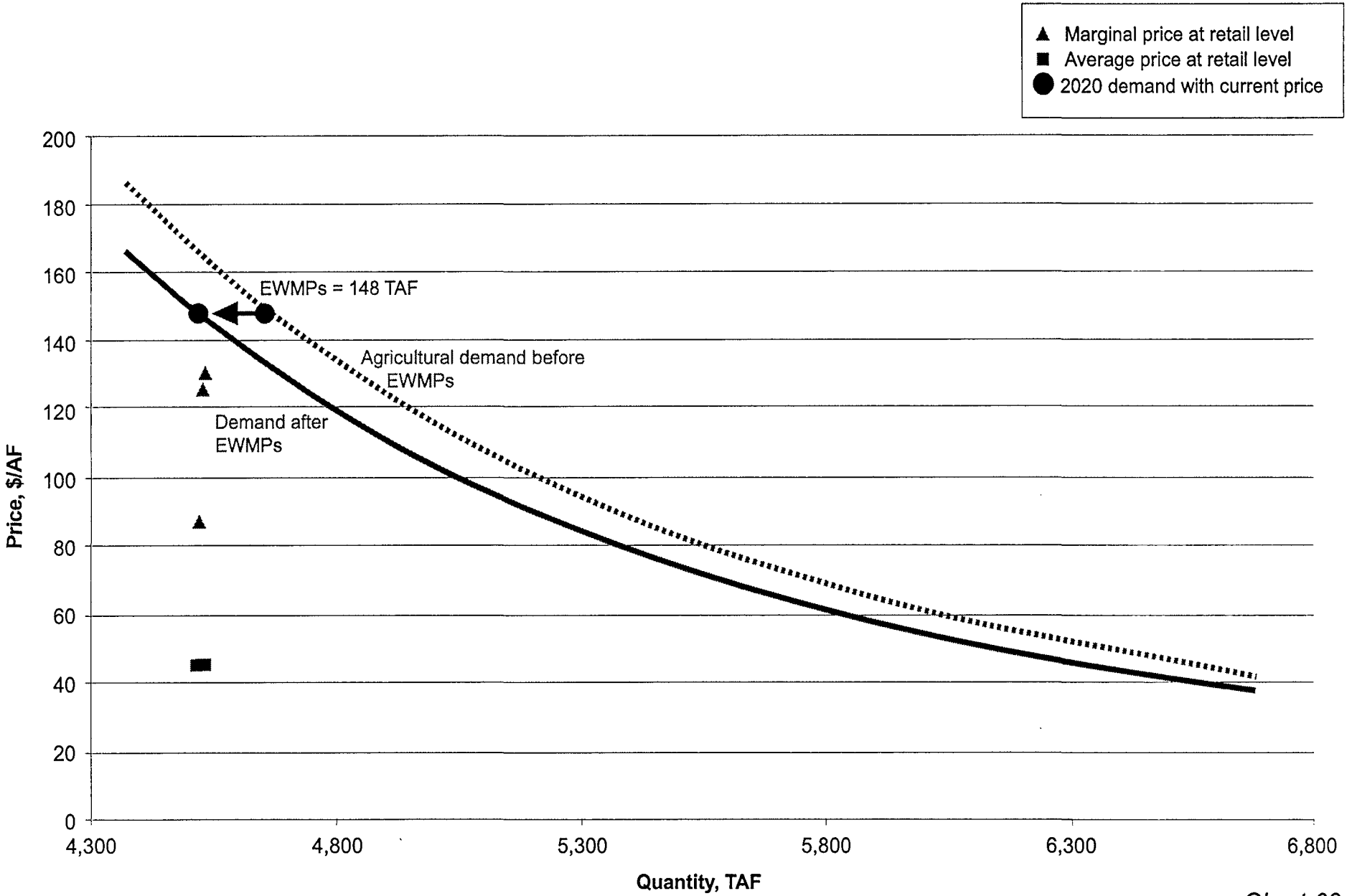

Chart 69

Screening Level Analysis
Urban Delta Exporters Preference Set With Isolated Facility Sensitivity Analysis
San Joaquin River Region

D-013675

D-013676

Table 69

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DELTA EXPORTERS PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS
SAN JOAQUIN RIVER REGION

Option			At Source (dry condition)							At Destination				
										At Farm			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	Dry Q (TAF/year)	Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	San Joaquin	EWMPs	6(148)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.15	1	0.106	$0	$0	0.9	$87	4,519	$87	$45.01
Other	Delta	South Delta Improvements	65	$110	1.15	1	0.106	$30	$0	7.9	$126	4,527	$126	$45.15
Active Conj. Use	San Joaquin	Project 1	40	$150	1.15	1	0.106	$0	$0	4.9	$130	4,532	$130	$45.24

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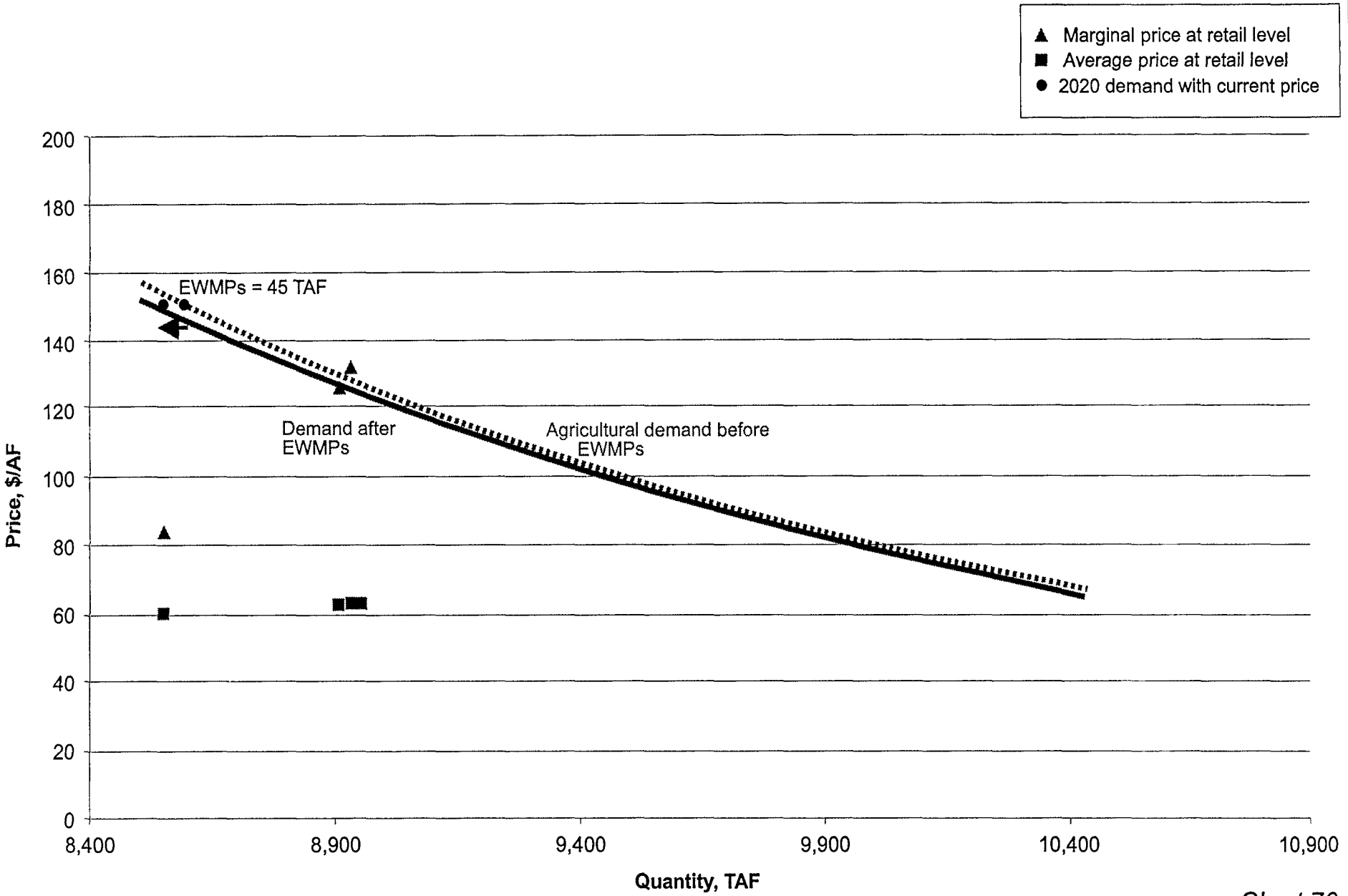

Chart 70

Screening Level Analysis

Urban Delta Exporters Preference Set With Isolated Facility Sensitivity Analysis

Tulare Lake Region

D-013677

D-013677

Table 70

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DELTA EXPORTERS PREFERENCE SET WITH ISOLATED FACILITY SENSITIVITY ANALYSIS

TULARE LAKE REGION

Option			At Source (dry condition)							At Destination			Retail Price Using:	
Type	Location	Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	At Farm Dry Q (TAF/year)	At Farm Dry P ($/AF)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Ag WUE	Tulare	EWMPs	33(45)											
Options screened to meet demand														
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.19	1	0.322	$0	$0	2.7	$84	8,550	$84	$60.01
Active Conj. Use	Tulare	Kern Water Bank	300	$150	1.19	1	1	$0	$0	357.0	$126	8,907	$126	$62.65
Other	Delta	South Delta Improvements	65	$110	1.19	1	0.322	$40	$0	24.9	$132	8,932	$132	$62.85
Active Conj. Use	San Joaquin	Project 1	40	$150	1.19	1	0.322	$60	$25	15.3	$211	8,947	$211	$63.10

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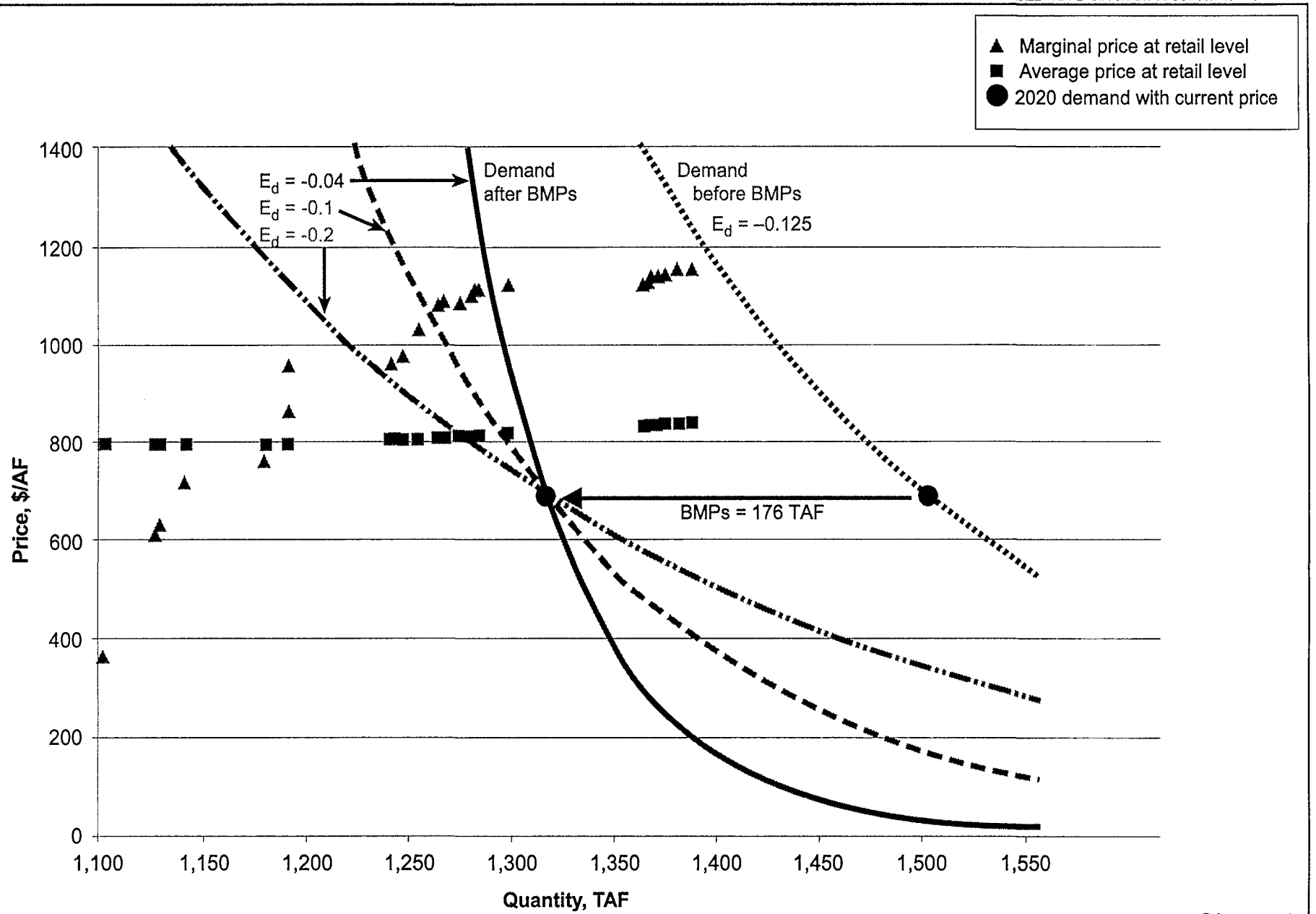

Chart 71
Screening Level Analysis
Urban Demand Elasticity Sensitivity Analysis
San Francisco Bay Region

D-013679

D-013679

Table 71
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DEMAND ELASTICITY SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_0 Quantity (TAF/year)	At Source (dry condition) C_0 Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$279	$482	$520	25.0	1103.0	$362	$799
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$276	$482	$520	25.0	1,128.0	$612	$796
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$275	$482	$520	2.0	1,130.0	$632	$795
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$275	$482	$520	13.0	1,143.0	$722	$795
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$275	$482	$520	38.0	1,181.0	$762	$795
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	1	$0	$0	$0	-$120	$0	$380	$276	$482	$520	11.0	1,192.0	$862	$796
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	10%	0.094	$60	$25	$248	$0	$0	$476	$276	$482	$520	0.6	1,192.6	$958	$796
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	0.8	$0	$0	$0	-$120	-$500	$480	$283	$482	$520	40.0	1,232.6	$962	$803
Additional options to the right of the demand function, Ed = -0.2 (after BMPs)																					
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	0.2	$0	$0	$0	-$120	-$500	$480	$284	$482	$520	10.0	1,242.6	$962	$804
Other	Delta	South Delta Improvements	85	$110	1	1	10%	0.094	$90	$0	$248	$0	$0	$493	$285	$482	$520	5.5	1,248.1	$975	$805
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$182	1	1	10%	0.164	$90	$0	$248	$0	$0	$550	$287	$482	$520	7.4	1,255.5	$1,032	$807
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	0.35	$0	$0	$0	$0	$0	$600	$288	$482	$520	3.5	1,259.0	$1,082	$808
Additional options to the right of the demand function, Ed = -0.1 (after BMPs)																					
Other	S.F. Bay	Surface Storage	10	$600	1	1	0%	0.65	$0	$0	$0	$0	$0	$600	$289	$482	$520	6.5	1,265.5	$1,082	$809
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	10%	0.094	$90	$25	$248	$0	$0	$606	$290	$482	$520	2.7	1,268.2	$1,088	$810
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$606	$292	$482	$520	7.1	1,275.3	$1,088	$812
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	10%	0.164	$90	$25	$248	$0	$0	$619	$293	$482	$520	5.9	1,281.2	$1,101	$813
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	10%	0.164	$90	$0	$248	$0	$0	$627	$294	$482	$520	1.3	1,282.5	$1,109	$814
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$294	$482	$520	2.0	1,284.5	$1,112	$814
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.064	$60	$25	$248	$0	$0	$641	$296	$482	$520	5.8	1,290.3	$1,123	$816
Additional options to the right of the demand function, Ed = -0.042 (after BMPs)																					
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.1	$60	$25	$248	$0	$0	$641	$298	$482	$520	9.0	1,299.3	$1,123	$818
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1	1	10%	0.02	$90	$0	$248	$0	$0	$642	$300	$482	$520	8.1	1,307.4	$1,124	$820
Additional options to the right of the demand function if AC pricing is used, Ed = -0.042 (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1	1	10%	0.144	$90	$0	$248	$0	$0	$642	$315	$482	$520	58.3	1,365.7	$1,124	$835
Land Fallow	San Joaquin	Range 1	12	$224	1	1	10%	0.164	$90	$25	$248	$0	$0	$646	$315	$482	$520	1.8	1,367.4	$1,128	$835
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$654	$316	$482	$520	1.2	1,368.6	$1,136	$836
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$656	$316	$482	$520	3.3	1,371.9	$1,138	$836
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$658	$317	$482	$520	3.8	1,375.7	$1,140	$837
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	10%	0.164	$90	$25	$248	$0	$0	$674	$319	$482	$520	5.9	1,381.6	$1,156	$839
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$674	$321	$482	$520	7.1	1,388.7	$1,156	$841
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	1	$0	$0	$0	-$120	$0	$680	$331	$482	$520	39.0	1,427.7	$1,182	$851
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$682	$331	$482	$520	3.3	1,431.0	$1,184	$851
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$687	$332	$482	$520	3.8	1,434.8	$1,189	$852
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$695	$333	$482	$520	3.0	1,437.8	$1,177	$853
Land Fallow	San Joaquin	Range 2	12	$279	1	1	10%	0.164	$90	$25	$248	$0	$0	$706	$334	$482	$520	1.8	1,439.5	$1,188	$854
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$713	$334	$482	$520	3.3	1,442.8	$1,195	$854
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$718	$335	$482	$520	3.8	1,446.8	$1,200	$855
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	10%	0.164	$90	$25	$248	$0	$0	$729	$337	$482	$520	5.9	1,452.5	$1,211	$857
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$337	$482	$520	1.2	1,453.7	$1,222	$857
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$338	$482	$520	3.0	1,456.7	$1,222	$858
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$743	$340	$482	$520	7.1	1,463.8	$1,225	$860
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$748	$341	$482	$520	3.3	1,467.1	$1,228	$861
Land Fallow	Sacramento	Range 12	32	$256	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$751	$342	$482	$520	3.8	1,470.9	$1,233	$862
Land Fallow	San Joaquin	Range 3	12	$336	1	1	10%	0.164	$90	$25	$248	$0	$0	$769	$343	$482	$520	1.8	1,472.6	$1,251	$863
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$777	$344	$482	$520	3.3	1,475.9	$1,259	$864
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$783	$345	$482	$520	3.8	1,479.7	$1,265	$865
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$786	$346	$482	$520	3.0	1,482.7	$1,270	$866
Land Fallow	Tulare	Range 1	67	$387	1	1	10%	0.164	$60	$25	$248	$0	$0	$792	$349	$482	$520	9.9	1,492.6	$1,274	$869
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$812	$351	$482	$520	7.1	1,499.6	$1,294	$871
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$836	$352	$482	$520	3.0	1,502.6	$1,318	$872
Land Fallow	San Joaquin	Range 4	12	$406	1	1	10%	0.164	$90	$25	$248	$0	$0	$845	$352	$482	$520	1.8	1,504.4	$1,327	$872
Land Fallow	Tulare	Range 2	67	$438	1	1	10%	0.164	$60	$25	$248	$0	$0	$848	$355	$482	$520	9.9	1,514.3	$1,330	$875
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$377	$482	$520	70.0	1,584.3	$1,332	$897
Urban Recycling	S.F. Bay	Range 4	86	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$980	$403	$482	$520	85.0	1,669.3	$1,362	$923
Land Fallow	Sacramento	Range 17	10	$365	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$887	$403	$482	$520	1.2	1,670.4	$1,369	$923
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	10%	0.164	$60	$25	$248	$0	$0	$889	$403	$482	$520	0.7	1,671.2	$1,371	$923

D-013680

D—013680

Table 71

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DEMAND ELASTICITY SENSITIVITY ANALYSIS

SAN FRANCISCO BAY REGION

			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Option Measure	Q_0 Quantity (TAF/year)	C_0 Unit Cost ($/AF)	F_R Reappli-cation Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_R Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$896	$404	$482	$520	3.0	1,674.1	$1,378	$924
Land Fallow	San Joaquin	Range 5	21	$452	1	1	10%	0.164	$90	$25	$248	$0	$0	$897	$405	$482	$520	3.1	1,677.2	$1,379	$925
Land Fallow	Tulare	Range 3	67	$490	1	1	10%	0.164	$60	$25	$248	$0	$0	$905	$408	$482	$520	9.9	1,687.1	$1,387	$928
Land Fallow	Tulare	Range 4	36	$492	1	1	10%	0.164	$60	$25	$248	$0	$0	$908	$410	$482	$520	5.3	1,692.4	$1,390	$930
Land Fallow	San Joaquin	Range 6	12	$483	1	1	10%	0.164	$90	$25	$248	$0	$0	$930	$410	$482	$520	1.8	1,694.2	$1,412	$930
Land Fallow	Tulare	Range 5	36	$540	1	1	10%	0.164	$60	$25	$248	$0	$0	$961	$412	$482	$520	5.3	1,699.5	$1,443	$932
Land Fallow	Tulare	Range 6	67	$542	1	1	10%	0.164	$60	$25	$248	$0	$0	$962	$415	$482	$520	9.9	1,709.4	$1,444	$935
Land Fallow	San Joaquin	Range 7	21	$622	1	1	10%	0.164	$90	$25	$248	$0	$0	$973	$416	$482	$520	3.1	1,712.5	$1,455	$936
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$419	$482	$520	7.0	1,719.5	$1,487	$939
Land Fallow	Tulare	Range 7	36	$588	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,013	$420	$482	$520	5.3	1,724.8	$1,495	$940
Land Fallow	Tulare	Range 8	67	$594	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,019	$424	$482	$520	9.9	1,734.7	$1,501	$944
Land Fallow	Tulare	Range 9	19	$607	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,034	$425	$482	$520	2.8	1,737.5	$1,516	$945
Land Fallow	San Joaquin	Range 8	21	$590	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,048	$428	$482	$520	3.1	1,740.6	$1,530	$946
Land Fallow	Tulare	Range 10	36	$635	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,065	$428	$482	$520	5.3	1,745.9	$1,547	$948
Land Fallow	Tulare	Range 11	19	$648	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,079	$429	$482	$520	2.8	1,748.7	$1,561	$949
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,100	$429	$482	$520	1.2	1,749.9	$1,582	$949
Land Fallow	Tulare	Range 12	36	$683	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,118	$431	$482	$520	5.3	1,755.2	$1,600	$951
Land Fallow	Tulare	Range 13	19	$688	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,123	$433	$482	$520	2.8	1,758.0	$1,605	$953
Land Fallow	San Joaquin	Range 9	21	$659	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,124	$434	$482	$520	3.1	1,761.1	$1,606	$954
Land Fallow	San Joaquin	Range 10	13	$694	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,162	$435	$482	$520	1.9	1,763.1	$1,644	$955
Land Fallow	Tulare	Range 14	19	$730	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,169	$436	$482	$520	2.8	1,765.9	$1,651	$956
Land Fallow	San Joaquin	Range 11	21	$729	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,201	$437	$482	$520	3.1	1,769.0	$1,683	$957
Land Fallow	San Joaquin	Range 12	13	$734	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,206	$438	$482	$520	1.9	1,770.9	$1,688	$958
Land Fallow	Tulare	Range 15	19	$771	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,214	$439	$482	$520	2.8	1,773.7	$1,696	$959
Land Fallow	San Joaquin	Range 13	13	$775	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,252	$440	$482	$520	1.9	1,775.6	$1,734	$960
Land Fallow	San Joaquin	Range 14	13	$815	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,296	$441	$482	$520	1.9	1,777.5	$1,778	$961
Land Fallow	Sacramento	Range 20	10	$566	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,315	$442	$482	$520	1.2	1,778.7	$1,797	$962
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$878	1	1	10%	0.164	$90	$0	$248	$0	$0	$1,335	$464	$482	$520	45.8	1,824.5	$1,817	$984
Land Fallow	San Joaquin	Range 15	13	$858	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,341	$465	$482	$520	1.9	1,826.4	$1,823	$985
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,411	$465	$482	$520	0.7	1,827.1	$1,893	$985
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, exist, develop.	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$494	$482	$520	50.0	1,877.1	$2,012	$1,014
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$514	$482	$520	28.0	1,905.1	$2,362	$1,034
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	10%	0.164	$60	$25	$248	$0	$0	$2,016	$519	$482	$520	6.5	1,911.6	$2,498	$1,039
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	10%	0.164	$90	$25	$248	$0	$0	$2,049	$520	$482	$520	1.0	1,912.6	$2,531	$1,040
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	10%	0.16	$90	$25	$248	$0	$0	$2,462	$522	$482	$520	1.8	1,914.4	$2,944	$1,042

D-013681

D—013681

D-013682

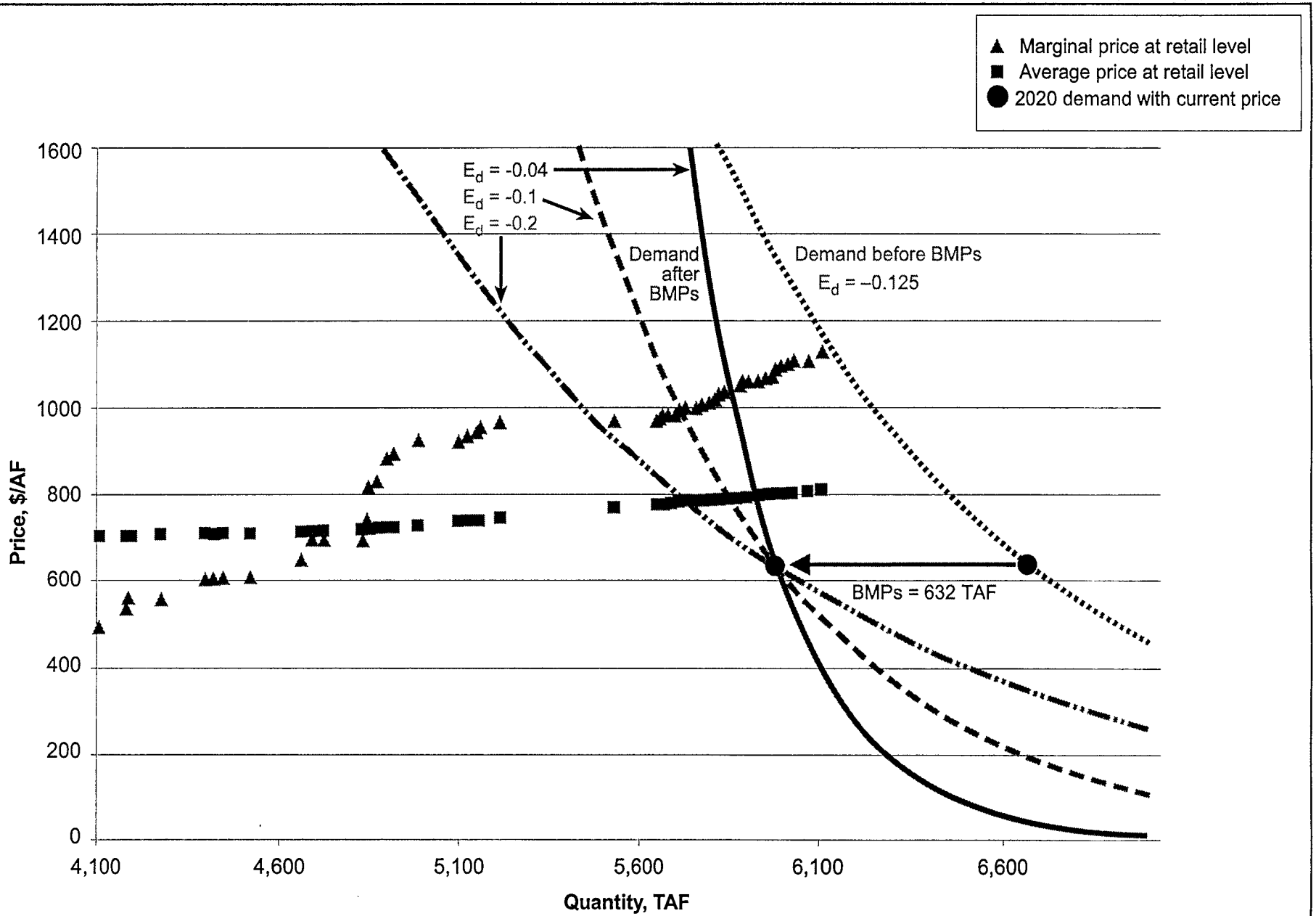

Chart 72

Screening Level Analysis
Urban Demand Elasticity Sensitivity Analysis
South Coast Region

D—013682

Table 72

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DEMAND ELASTICITY SENSITIVITY ANALYSIS
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_0 Quantity (TAF/year)	At Source (dry condition) C_0 Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_S MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$161	$202	$325	$500	24.0	4111.0	$486	$702
Ag WUE	Color. River	Tailwater recovery	55	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$202	$325	$500	70.9	4,181.8	$531	$702
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$202	$325	$500	7.6	4,189.5	$554	$702
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$202	$325	$500	91.6	4,281.0	$554	$702
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$204	$325	$500	119.9	4,400.9	$600	$704
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$205	$325	$500	20.7	4,421.6	$605	$706
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$205	$325	$500	28.3	4,450.0	$605	$706
Other	Color. River	All American Canal lining	68	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$207	$325	$500	74.1	4,524.1	$605	$707
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$210	$325	$500	141.7	4,665.8	$646	$710
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$211	$325	$500	29.4	4,695.2	$692	$711
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$212	$325	$500	32.7	4,727.9	$692	$712
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$216	$325	$500	109.0	4,836.9	$692	$716
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$216	$325	$500	10.9	4,847.8	$738	$716
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$248	$0	$0	$487	$216	$325	$500	2.4	4,850.2	$812	$716
Other	Delta	South Delta Improvements	85	$110	1.09	1	10%	0.344	$140	$0	$248	$0	$0	$503	$217	$325	$500	21.9	4,872.1	$828	$717
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$555	$219	$325	$500	29.5	4,901.6	$860	$719
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.344	$140	$25	$248	$0	$0	$568	$220	$325	$500	13.5	4,915.1	$893	$720
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$226	$325	$500	73.0	4,988.1	$921	$726
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$234	$325	$500	109.0	5,097.1	$921	$734
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	10%	0.601	$140	$25	$248	$0	$0	$606	$236	$325	$500	28.3	5,125.4	$931	$736
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	10%	0.601	$140	$25	$248	$0	$0	$619	$238	$325	$500	23.6	5,149.0	$944	$738
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$626	$238	$325	$500	5.3	5,154.3	$951	$738
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	10%	0.601	$110	$25	$248	$0	$0	$639	$243	$325	$500	59.0	5,213.3	$964	$743
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.09	1	10%	0.608	$140	$0	$248	$0	$0	$640	$262	$325	$500	268.4	5,481.7	$965	$762
Additional options to the right of the demand function, Ed = -0.2 (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$246	1.09	1	10%	0.11	$140	$0	$248	$0	$0	$640	$265	$325	$500	48.6	5,530.2	$965	$765
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$273	$325	$500	119.9	5,650.1	$967	$773
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$643	$274	$325	$500	8.5	5,658.6	$968	$774
Land Fallow	Sacramento	Range 1	10	$186	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$651	$274	$325	$500	5.6	5,664.2	$976	$774
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$652	$275	$325	$500	15.8	5,680.0	$977	$775
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$654	$277	$325	$500	18.0	5,698.0	$979	$777
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.25	$140	$25	$248	$0	$0	$669	$277	$325	$500	9.8	5,707.8	$994	$777
Additional options to the right of the demand function, Ed = -0.1 (after BMPs)																					
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.466	$140	$25	$248	$0	$0	$669	$278	$325	$500	18.4	5,726.2	$994	$778
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$669	$281	$325	$500	33.8	5,760.0	$994	$781
Land Fallow	Sacramento	Range 4	28	$205	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$678	$282	$325	$500	15.8	5,775.8	$1,001	$782
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$681	$283	$325	$500	18.0	5,793.8	$1,006	$783
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$688	$284	$325	$500	14.2	5,808.0	$1,013	$784
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$698	$285	$325	$500	8.5	5,816.5	$1,023	$785
Land Fallow	Sacramento	Range 7	28	$228	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$705	$286	$325	$500	15.8	5,832.2	$1,030	$786
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$710	$287	$325	$500	18.0	5,850.3	$1,035	$787
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.029	$140	$25	$248	$0	$0	$720	$287	$325	$500	1.1	5,851.4	$1,045	$787
Additional options to the right of the demand function, Ed = -0.042 (after BMPs)																					
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.688	$140	$25	$248	$0	$0	$720	$289	$325	$500	27.0	5,878.4	$1,045	$789
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$290	$325	$500	5.7	5,884.1	$1,055	$790
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$291	$325	$500	14.2	5,898.3	$1,055	$791
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.455	$140	$25	$248	$0	$0	$732	$292	$325	$500	21.4	5,919.7	$1,057	$792
Additional options to the right of the demand function if AC pricing is used, Ed = -0.042 (after BMPs)																					
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.263	$140	$25	$248	$0	$0	$732	$293	$325	$500	12.4	5,932.1	$1,057	$793
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$735	$294	$325	$500	15.8	5,947.9	$1,060	$794
Land Fallow	Sacramento	Range 12	32	$256	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$740	$296	$325	$500	18.0	5,965.9	$1,065	$796
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$756	$296	$325	$500	8.5	5,974.4	$1,081	$796
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$763	$298	$325	$500	15.8	5,990.1	$1,088	$798
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$768	$299	$325	$500	18.0	6,008.2	$1,093	$799
Land Fallow	Sacramento	Range 15	25	$263	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$774	$300	$325	$500	14.1	6,022.2	$1,099	$800
Land Fallow	Tulare	Range 1	67	$387	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$777	$304	$325	$500	47.2	6,069.4	$1,102	$804
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$796	$307	$325	$500	33.8	6,103.3	$1,120	$807
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 16	25	$317	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$817	$308	$325	$500	14.2	6,117.4	$1,142	$808
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$336	$325	$500	369.7	6,477.1	$1,151	$836

D-013683

D—013683

Table 72

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DEMAND ELASTICITY SENSITIVITY ANALYSIS
SOUTH COAST REGION

			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Option Measure	Q_O Quantity (TAF/year)	C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_D Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Land Fallow	San Joaquin	Range 4	12	$408	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$826	$337	$325	$500	8.5	6,485.6	$1,151	$837
Land Fallow	Tulare	Range 2	67	$438	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$828	$341	$325	$500	47.2	6,532.8	$1,153	$841
Land Fallow	Sacramento	Range 17	10	$355	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$864	$341	$325	$500	5.6	6,538.4	$1,189	$841
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$866	$341	$325	$500	3.5	6,541.9	$1,191	$841
Land Fallow	Sacramento	Range 18	25	$362	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$873	$343	$325	$500	14.1	6,556.0	$1,198	$843
Land Fallow	San Joaquin	Range 5	21	$452	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$873	$344	$325	$500	14.8	6,570.8	$1,198	$844
Land Fallow	Tulare	Range 3	67	$490	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$881	$348	$325	$500	47.2	6,618.0	$1,206	$848
Land Fallow	Tulare	Range 4	36	$492	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$883	$350	$325	$500	25.4	6,643.4	$1,208	$850
Land Fallow	San Joaquin	Range 6	12	$483	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$904	$350	$325	$500	8.5	6,651.8	$1,229	$850
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	1	$0	$0	$0	-$100	$0	$917	$359	$325	$500	109.0	6,760.8	$1,242	$859
Land Fallow	Tulare	Range 5	36	$540	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$932	$362	$325	$500	25.4	6,786.2	$1,257	$862
Land Fallow	Tulare	Range 6	67	$542	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$933	$366	$325	$500	47.2	6,833.4	$1,258	$866
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$367	$325	$500	20.7	6,854.1	$1,265	$867
Land Fallow	San Joaquin	Range 7	21	$522	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$943	$369	$325	$500	14.8	6,868.9	$1,268	$869
Land Fallow	Tulare	Range 7	36	$588	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$960	$371	$325	$500	25.4	6,894.2	$1,305	$871
Land Fallow	Tulare	Range 8	67	$594	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$966	$375	$325	$500	47.2	6,941.4	$1,311	$875
Land Fallow	Tulare	Range 9	19	$607	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$999	$376	$325	$500	13.4	6,954.8	$1,324	$876
Land Fallow	San Joaquin	Range 8	21	$590	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,012	$377	$325	$500	14.8	6,969.6	$1,337	$877
Land Fallow	Tulare	Range 10	36	$636	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,027	$380	$325	$500	25.4	6,994.9	$1,352	$880
Land Fallow	Tulare	Range 11	19	$648	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,041	$381	$325	$500	13.4	7,008.3	$1,366	$881
Land Fallow	Sacramento	Range 19	10	$510	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,060	$382	$325	$500	5.6	7,014.0	$1,385	$882
Land Fallow	Tulare	Range 12	36	$683	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,076	$384	$325	$500	25.4	7,039.3	$1,401	$884
Land Fallow	Tulare	Range 13	19	$688	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,081	$385	$325	$500	13.4	7,052.7	$1,406	$885
Land Fallow	San Joaquin	Range 9	21	$659	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,082	$387	$325	$500	14.8	7,067.5	$1,407	$887
Land Fallow	San Joaquin	Range 10	13	$694	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,117	$388	$325	$500	9.2	7,076.6	$1,442	$888
Land Fallow	Tulare	Range 14	19	$730	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,123	$389	$325	$500	13.4	7,090.0	$1,448	$889
Land Fallow	San Joaquin	Range 11	21	$728	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,152	$391	$325	$500	14.8	7,104.8	$1,477	$891
Land Fallow	San Joaquin	Range 12	13	$734	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,157	$392	$325	$500	9.2	7,114.0	$1,482	$892
Land Fallow	Tulare	Range 15	19	$771	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,166	$393	$325	$500	13.4	7,127.4	$1,490	$893
Land Fallow	San Joaquin	Range 13	13	$776	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,199	$394	$325	$500	9.2	7,136.5	$1,524	$894
Land Fallow	San Joaquin	Range 14	13	$815	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,239	$396	$325	$500	9.2	7,145.7	$1,564	$896
Land Fallow	Sacramento	Range 20	10	$666	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,257	$396	$325	$500	5.6	7,151.3	$1,582	$896
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$1,276	$422	$325	$500	218.4	7,369.7	$1,601	$922
Land Fallow	San Joaquin	Range 15	13	$858	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,281	$423	$325	$500	9.2	7,378.8	$1,606	$923
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$426	$325	$500	20.7	7,399.5	$1,609	$926
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$438	$325	$500	109.0	7,508.5	$1,609	$938
Urban Recycling	South Coast	Range 5	436	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$488	$325	$500	474.2	7,982.7	$1,609	$988
Ag WUE	Tulare	Increase efficiency, Range 3	5	$960	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,345	$489	$325	$500	3.5	7,986.2	$1,670	$989
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,650	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$511	$325	$500	195.1	8,181.3	$1,747	$1,011
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$524	$325	$500	88.3	8,269.6	$2,068	$1,024
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,900	$529	$325	$500	31.0	8,300.6	$2,225	$1,029
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,931	$530	$325	$500	4.9	8,305.5	$2,256	$1,030
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$2,309	$532	$325	$500	8.5	8,314.0	$2,634	$1,032

D-013684

D—013684

D-013685

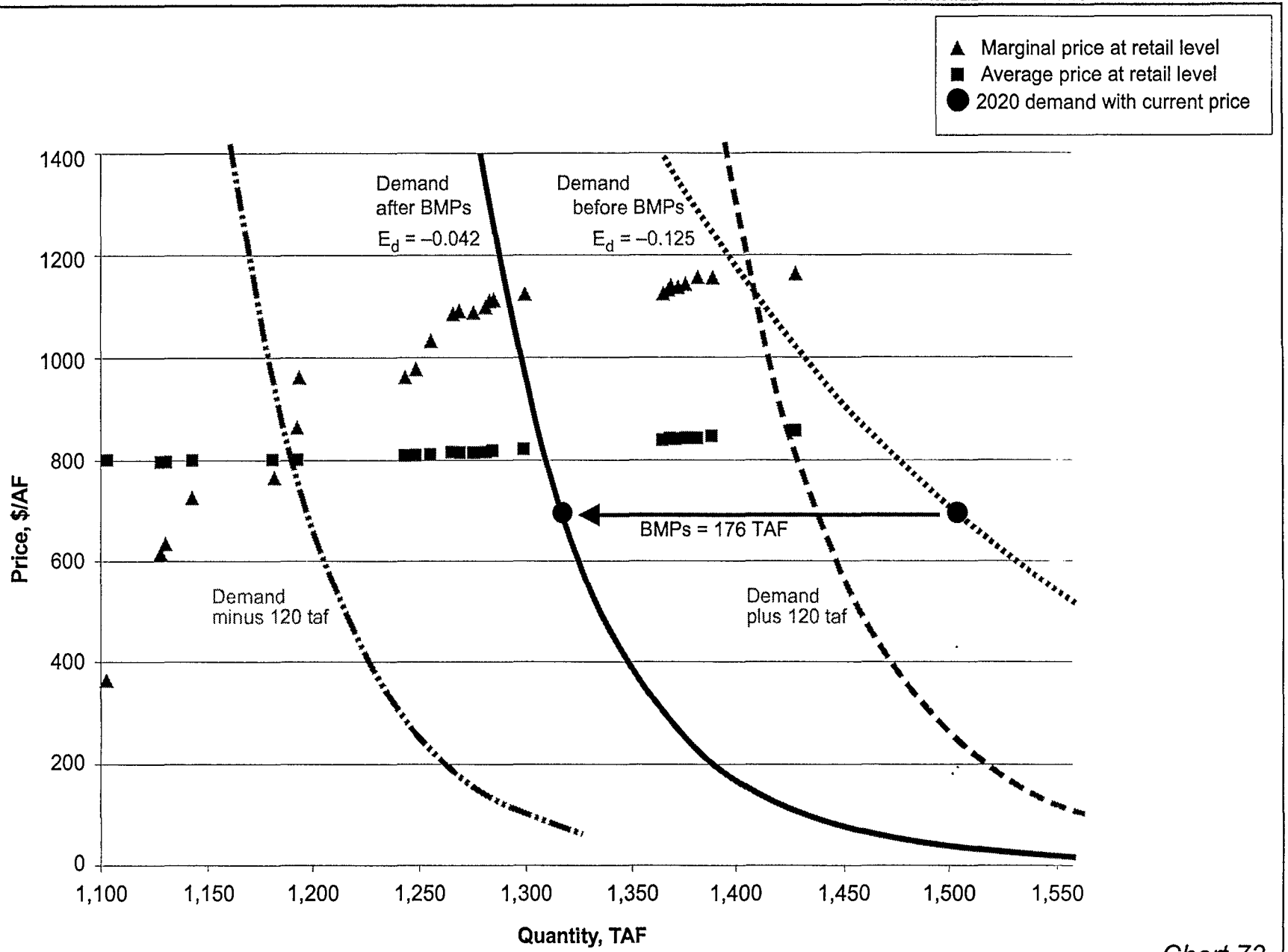

Chart 73

Screening Level Analysis
Urban Demand Forecast Sensitivity Analysis
San Francisco Bay Region

D—013685

Table 73
SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DEMAND FORECAST SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

Type	Location	Option Measure	At Source (dry condition) Q_O Quantity (TAF/year)	At Source (dry condition) C_O Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Urban WUE	S.F. Bay	BMPs	172(176)																		
Options screened to meet demand																					
Urban Recycling	S.F. Bay	Range 1	25	$500	1	1	0%	1	$0	$0	$0	-$120	-$500	-$120	$279	$482	$520	25.0	1103.0	$362	$799
Urban Recycling	S.F. Bay	Range 2	25	$750	1	1	0%	1	$0	$0	$0	-$120	-$500	$130	$276	$482	$520	25.0	1,128.0	$612	$796
Other	S.F. Bay	Conjunctive Use	2	$150	1	1	0%	1	$0	$0	$0	$0	$0	$150	$275	$482	$520	2.0	1,130.0	$632	$795
Urban WUE	S.F. Bay	Reduce distribution system losses to 5%	13	$300	1	1	0%	1	$0	$0	$0	-$60	$0	$240	$275	$482	$520	13.0	1,143.0	$722	$795
Urban WUE	S.F. Bay	Reduce indoor water use to 60 gpcd	38	$400	1	1	0%	1	$0	$0	$0	-$120	$0	$280	$275	$482	$520	38.0	1,181.0	$762	$795
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	0.15	$0	$0	$0	-$120	$0	$380	$275	$482	$520	1.7	1,182.7	$862	$795
Additional options to the right of the demand function, with demand minus 120 TAF (after BMPs)																					
Urban WUE	S.F. Bay	Reduce indoor CII use by 3%	11	$500	1	1	0%	0.85	$0	$0	$0	-$120	$0	$380	$276	$482	$520	9.4	1,192.0	$862	$796
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1	1	10%	0.094	$60	$25	$248	$0	$0	$478	$278	$482	$520	0.8	1,192.8	$958	$796
Urban Recycling	S.F. Bay	Range 3	50	$1,100	1	1	0%	1	$0	$0	$0	-$120	-$500	$480	$284	$482	$520	50.0	1,242.8	$962	$804
Other	Delta	South Delta Improvements	65	$110	1	1	10%	0.094	$90	$0	$248	$0	$0	$493	$285	$482	$520	5.5	1,248.1	$975	$805
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1	1	10%	0.164	$90	$0	$248	$0	$0	$550	$287	$482	$520	7.4	1,255.5	$1,032	$807
Other	S.F. Bay	Surface Storage	10	$800	1	1	0%	1	$0	$0	$0	$0	$0	$600	$289	$482	$520	10.0	1,265.5	$1,082	$809
Active Conj. Use	San Joaquin	Project 1	40	$150	1	0.8	10%	0.094	$90	$25	$248	$0	$0	$606	$290	$482	$520	2.7	1,268.2	$1,088	$810
Active Conj. Use	Sacramento	Project 1	60	$150	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$606	$292	$482	$520	7.1	1,275.3	$1,088	$812
Active Conj. Use	San Joaquin	Project 2	40	$200	1	1	10%	0.164	$90	$25	$248	$0	$0	$619	$293	$482	$520	5.9	1,281.2	$1,101	$813
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1	1	10%	0.164	$90	$0	$248	$0	$0	$627	$294	$482	$520	1.3	1,282.5	$1,109	$814
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, new develop.	2	$750	1	1	0%	1	$0	$0	$0	-$120	$0	$630	$294	$482	$520	2.0	1,284.5	$1,112	$814
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.064	$60	$25	$248	$0	$0	$641	$296	$482	$520	5.8	1,290.3	$1,123	$816
Additional options to the right of the demand function (after BMPs)																					
Active Conj. Use	Tulare	Project 1	100	$250	1	1	10%	0.1	$60	$25	$248	$0	$0	$641	$298	$482	$520	9.0	1,299.3	$1,123	$818
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1	1	10%	0.02	$90	$0	$248	$0	$0	$642	$300	$482	$520	8.1	1,307.4	$1,124	$820
Additional options to the right of the demand function if AC pricing is used (after BMPs)																					
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1	1	10%	0.144	$90	$0	$248	$0	$0	$642	$315	$482	$520	58.3	1,365.7	$1,124	$835
Land Fallow	San Joaquin	Range 1	12	$224	1	1	10%	0.164	$90	$25	$248	$0	$0	$646	$315	$482	$520	1.8	1,367.4	$1,128	$835
Land Fallow	Sacramento	Range 1	10	$185	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$654	$316	$482	$520	1.2	1,368.6	$1,136	$836
Land Fallow	Sacramento	Range 2	28	$187	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$656	$316	$482	$520	3.3	1,371.9	$1,138	$836
Land Fallow	Sacramento	Range 3	32	$188	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$658	$317	$482	$520	3.8	1,375.7	$1,140	$837
Active Conj. Use	San Joaquin	Project 3	40	$250	1	1	10%	0.164	$90	$25	$248	$0	$0	$674	$319	$482	$520	5.9	1,381.6	$1,156	$839
Active Conj. Use	Sacramento	Project 2	60	$200	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$674	$321	$482	$520	7.1	1,388.7	$1,156	$841
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	0.44	$0	$0	$0	-$120	$0	$680	$325	$482	$520	17.2	1,405.9	$1,162	$845
Additional options to the right of the demand function with demand plus 120 TAF (after BMPs)																					
Urban WUE	S.F. Bay	Reduce indoor water use from 60 to 55 gpcd	39	$800	1	1	0%	0.56	$0	$0	$0	-$120	$0	$680	$331	$482	$520	21.8	1,427.7	$1,162	$851
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 4	28	$205	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$682	$331	$482	$520	3.3	1,431.0	$1,164	$851
Land Fallow	Sacramento	Range 5	32	$209	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$687	$332	$482	$520	3.8	1,434.8	$1,169	$852
Land Fallow	Sacramento	Range 6	25	$215	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$695	$333	$482	$520	3.0	1,437.8	$1,177	$853
Land Fallow	San Joaquin	Range 2	12	$279	1	1	10%	0.164	$90	$25	$248	$0	$0	$706	$334	$482	$520	1.8	1,439.5	$1,188	$854
Land Fallow	Sacramento	Range 7	28	$228	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$713	$334	$482	$520	3.3	1,442.8	$1,195	$854
Land Fallow	Sacramento	Range 8	32	$232	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$718	$335	$482	$520	3.8	1,446.6	$1,200	$855
Active Conj. Use	San Joaquin	Project 4	40	$300	1	1	10%	0.164	$90	$25	$248	$0	$0	$729	$337	$482	$520	5.9	1,452.5	$1,211	$857
Land Fallow	Sacramento	Range 9	10	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$337	$482	$520	1.2	1,453.7	$1,222	$857
Land Fallow	Sacramento	Range 10	25	$248	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$740	$338	$482	$520	3.0	1,456.7	$1,222	$858
Active Conj. Use	Sacramento	Project 3	60	$250	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$743	$340	$482	$520	7.1	1,463.8	$1,225	$860
Land Fallow	Sacramento	Range 11	28	$252	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$746	$341	$482	$520	3.3	1,467.1	$1,228	$861
Land Fallow	Sacramento	Range 12	32	$256	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$751	$342	$482	$520	3.8	1,470.9	$1,233	$862
Land Fallow	San Joaquin	Range 3	12	$336	1	1	10%	0.164	$90	$25	$248	$0	$0	$769	$343	$482	$520	1.8	1,472.6	$1,251	$863
Land Fallow	Sacramento	Range 13	28	$275	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$777	$344	$482	$520	3.3	1,475.9	$1,259	$864
Land Fallow	Sacramento	Range 14	32	$279	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$783	$345	$482	$520	3.8	1,479.7	$1,265	$865
Land Fallow	Sacramento	Range 15	25	$283	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$788	$346	$482	$520	3.0	1,482.7	$1,270	$866
Land Fallow	Tulare	Range 1	67	$387	1	1	10%	0.164	$60	$25	$248	$0	$0	$792	$349	$482	$520	9.9	1,492.6	$1,274	$869
Active Conj. Use	Sacramento	Project 4	60	$300	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$812	$351	$482	$520	7.1	1,499.6	$1,294	$871
Land Fallow	Sacramento	Range 16	25	$317	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$836	$352	$482	$520	3.0	1,502.6	$1,318	$872
Land Fallow	San Joaquin	Range 4	12	$406	1	1	10%	0.164	$90	$25	$248	$0	$0	$845	$352	$482	$520	1.8	1,504.4	$1,327	$872
Land Fallow	Tulare	Range 2	67	$438	1	1	10%	0.164	$60	$25	$248	$0	$0	$848	$355	$482	$520	9.9	1,514.3	$1,330	$875

D-013686

D—013686

Table 73

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DEMAND FORECAST SENSITIVITY ANALYSIS
SAN FRANCISCO BAY REGION

			At Source (dry condition)											Unit Cost at Treatment Plant		Retail Cost Additive		At Destination		Retail Price Using:	
Type	Location	Option Measure	Q_s Quantity (TAF/year)	C_s Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_d Transport Cost	C_T Transaction Fee, $/AF	C_q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Marginal Unit Cost, $/AF	Average Unit Cost, $/AF	P_M Marginal Unit Cost $/AF	P_M Average Unit Cost $/AF	Q_D Retail Quantity (TAF/year)	Cumulative Quantity (TAF/year)	P_D Marginal Cost at Retail	P_D Average Cost at Retail
Other	S.F. Bay	American River	70	$850	1	1	0%	1	$0	$0	$0	$0	$0	$850	$377	$482	$520	70.0	1,584.3	$1,332	$897
Urban Recycling	S.F. Bay	Range 4	85	$1,500	1	1	0%	1	$0	$0	$0	-$120	-$500	$880	$403	$482	$520	85.0	1,669.3	$1,362	$923
Land Fallow	Sacramento	Range 17	10	$355	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$887	$403	$482	$520	1.2	1,670.4	$1,369	$923
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1	1	10%	0.164	$60	$25	$248	$0	$0	$889	$403	$482	$520	0.7	1,671.2	$1,371	$923
Land Fallow	Sacramento	Range 18	25	$362	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$896	$404	$482	$520	3.0	1,674.1	$1,378	$924
Land Fallow	San Joaquin	Range 5	21	$452	1	1	10%	0.164	$90	$25	$248	$0	$0	$897	$405	$482	$520	3.1	1,677.2	$1,379	$925
Land Fallow	Tulare	Range 3	67	$490	1	1	10%	0.164	$60	$25	$248	$0	$0	$905	$408	$482	$520	9.9	1,687.1	$1,387	$928
Land Fallow	Tulare	Range 4	36	$492	1	1	10%	0.164	$60	$25	$248	$0	$0	$908	$410	$482	$520	5.3	1,692.4	$1,390	$930
Land Fallow	San Joaquin	Range 6	12	$483	1	1	10%	0.164	$90	$25	$248	$0	$0	$930	$410	$482	$520	1.8	1,694.2	$1,412	$930
Land Fallow	Tulare	Range 5	36	$540	1	1	10%	0.164	$60	$25	$248	$0	$0	$961	$412	$482	$520	5.3	1,699.5	$1,443	$932
Land Fallow	Tulare	Range 6	67	$542	1	1	10%	0.164	$60	$25	$248	$0	$0	$962	$415	$482	$520	9.9	1,709.4	$1,444	$935
Land Fallow	San Joaquin	Range 7	21	$522	1	1	10%	0.164	$90	$25	$248	$0	$0	$973	$416	$482	$520	3.1	1,712.5	$1,455	$936
Urban WUE	S.F. Bay	Reduce indoor CII use from 3% to 5%	7	$1,125	1	1	0%	1	$0	$0	$0	-$120	$0	$1,005	$419	$482	$520	7.0	1,719.5	$1,487	$939
Land Fallow	Tulare	Range 7	36	$588	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,013	$420	$482	$520	5.3	1,724.8	$1,495	$940
Land Fallow	Tulare	Range 8	67	$594	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,019	$424	$482	$520	9.9	1,734.7	$1,501	$944
Land Fallow	Tulare	Range 9	19	$607	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,034	$425	$482	$520	2.8	1,737.5	$1,516	$945
Land Fallow	San Joaquin	Range 8	21	$590	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,048	$426	$482	$520	3.1	1,740.6	$1,530	$946
Land Fallow	Tulare	Range 10	36	$635	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,065	$428	$482	$520	5.3	1,745.9	$1,547	$948
Land Fallow	Tulare	Range 11	19	$648	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,079	$429	$482	$520	2.8	1,748.7	$1,561	$949
Land Fallow	Sacramento	Range 19	10	$510	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,100	$429	$482	$520	1.2	1,749.9	$1,582	$949
Land Fallow	Tulare	Range 12	36	$683	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,118	$431	$482	$520	5.3	1,755.2	$1,600	$951
Land Fallow	Tulare	Range 13	19	$688	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,123	$433	$482	$520	2.8	1,758.0	$1,605	$953
Land Fallow	San Joaquin	Range 9	21	$659	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,124	$434	$482	$520	3.1	1,761.1	$1,606	$954
Land Fallow	San Joaquin	Range 10	13	$694	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,162	$435	$482	$520	1.9	1,763.1	$1,644	$955
Land Fallow	Tulare	Range 14	19	$730	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,159	$436	$482	$520	2.8	1,765.9	$1,651	$956
Land Fallow	San Joaquin	Range 11	21	$728	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,201	$437	$482	$520	3.1	1,769.0	$1,683	$957
Land Fallow	San Joaquin	Range 12	13	$734	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,206	$438	$482	$520	1.9	1,770.9	$1,688	$958
Land Fallow	Tulare	Range 15	19	$771	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,214	$439	$482	$520	2.8	1,773.7	$1,696	$959
Land Fallow	San Joaquin	Range 13	13	$775	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,252	$440	$482	$520	1.9	1,775.6	$1,734	$960
Land Fallow	San Joaquin	Range 14	13	$815	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,296	$441	$482	$520	1.9	1,777.5	$1,778	$961
Land Fallow	Sacramento	Range 20	10	$866	1	0.8	10%	0.164	$90	$25	$248	$0	$0	$1,315	$442	$482	$520	1.2	1,778.7	$1,797	$962
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$876	1	1	10%	0.164	$90	$0	$248	$0	$0	$1,335	$464	$482	$520	45.8	1,824.5	$1,817	$984
Land Fallow	San Joaquin	Range 15	13	$856	1	1	10%	0.164	$90	$25	$248	$0	$0	$1,341	$465	$482	$520	1.9	1,826.4	$1,823	$985
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1	1	10%	0.164	$60	$25	$248	$0	$0	$1,411	$465	$482	$520	0.7	1,827.1	$1,893	$985
Urban WUE	S.F. Bay	Reduce outdoor use to 0.8 ET, extet. develop	50	$1,650	1	1	0%	1	$0	$0	$0	-$120	$0	$1,530	$494	$482	$520	50.0	1,877.1	$2,012	$1,014
Urban WUE	S.F. Bay	Reduce indoor CII use from 5% to 11%	28	$2,000	1	1	0%	1	$0	$0	$0	-$120	$0	$1,880	$514	$482	$520	28.0	1,905.1	$2,362	$1,034
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1	1	10%	0.164	$60	$25	$248	$0	$0	$2,016	$519	$482	$520	6.5	1,911.6	$2,496	$1,039
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1	1	10%	0.164	$90	$25	$248	$0	$0	$2,049	$520	$482	$520	1.0	1,912.6	$2,531	$1,040
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1	0.80	10%	0.16	$90	$25	$248	$0	$0	$2,462	$522	$482	$520	1.8	1,914.4	$2,944	$1,042

D-013687

D—013687

D-013688

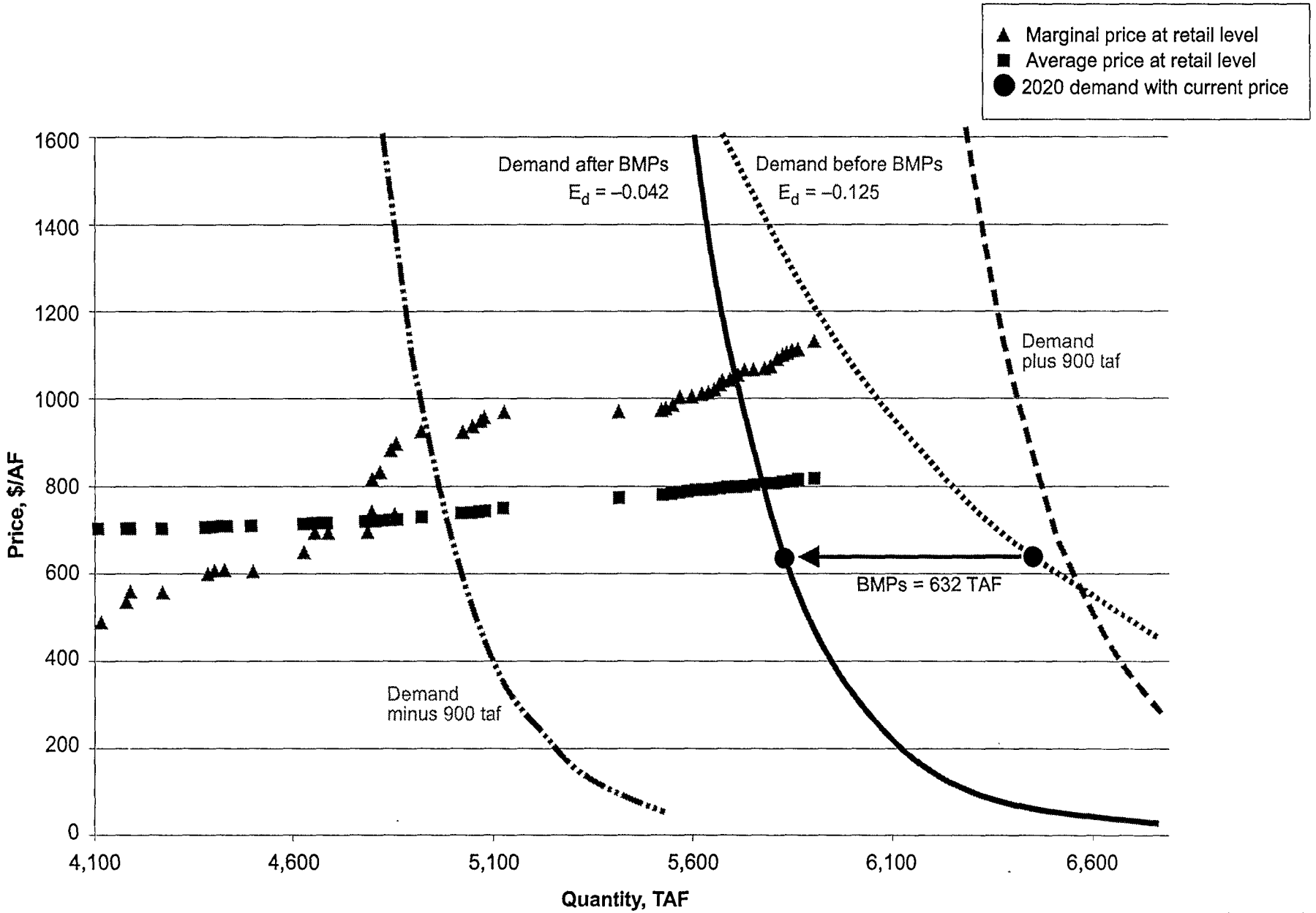

Chart 74

Screening Level Analysis
Urban Demand Forecast Sensitivity Analysis
South Coast Region

D—013688

Table 74

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DEMAND FORECAST SENSITIVITY ANALYSIS
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_0 Quantity (TAF/year)	At Source (dry condition) C_0 Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_B Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
BMPs and other new conservation savings			628																		
Options screened to meet demand																					
Ag WUE	Color. River	Increase efficiency, Range 1	22	$100	1.09	1	0%	1	$50	$25	$0	$0	$0	$181	$202	$325	$500	24.0	4111.0	$486	$702
Ag WUE	Color. River	Tailwater recovery	65	$150	1.09	1	0%	1	$50	$25	$0	$0	$0	$206	$202	$325	$500	70.9	4,181.8	$531	$702
Other	South Coast	Agriculture WUE Range 1	7	$250	1.09	1	0%	1	$0	$0	$0	$0	$0	$229	$202	$325	$500	7.6	4,189.5	$554	$702
Urban WUE	South Coast	Reduce distribution system losses to 5%	84	$300	1.09	1	0%	1	$0	$0	$0	-$50	$0	$229	$202	$325	$500	91.6	4,281.0	$554	$702
Urban WUE	South Coast	Reduce indoor water use to 60 gpcd	110	$400	1.09	1	0%	1	$0	$0	$0	-$100	$0	$275	$204	$325	$500	119.9	4,400.9	$600	$704
Other	Color. River	Future land fallowing agreements	100	$230	1.09	1	0%	0.19	$50	$25	$0	$0	$0	$280	$205	$325	$500	20.7	4,421.6	$605	$705
Other	Color. River	Coachella Canal lining	26	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$205	$325	$500	28.3	4,450.0	$605	$705
Other	Color. River	All American Canal lining	66	$230	1.09	1	0%	1	$50	$25	$0	$0	$0	$280	$207	$325	$500	74.1	4,524.1	$605	$707
Other	South Coast	Conjunctive Use	130	$350	1.09	1	0%	1	$0	$0	$0	$0	$0	$321	$210	$325	$500	141.7	4,665.8	$646	$710
Other	South Coast	Desalination Range 1	27	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$211	$325	$500	29.4	4,695.2	$692	$711
Urban WUE	South Coast	Reduce indoor CII use by 3%	30	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$212	$325	$500	32.7	4,727.9	$692	$712
Urban Recycling	South Coast	Range 1	100	$500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$367	$216	$325	$500	109.0	4,836.9	$692	$716
Other	South Coast	Agriculture WUE Range 2	10	$450	1.09	1	0%	1	$0	$0	$0	$0	$0	$413	$218	$325	$500	10.9	4,847.8	$738	$716
Ag WUE	Tulare	Increase efficiency, Range 1	7	$100	1.09	1	10%	0.344	$110	$25	$248	$0	$0	$487	$218	$325	$500	2.4	4,850.2	$812	$716
Other	Delta	South Delta Improvements	65	$110	1.09	1	10%	0.344	$140	$0	$248	$0	$0	$503	$217	$325	$500	21.9	4,872.1	$828	$717
Surface Storage	Sacramento	Sac. River Onstream High Yield Est.	50	$162	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$555	$219	$325	$500	29.5	4,901.6	$880	$719
Active Conj. Use	San Joaquin	Project 1	40	$150	1.09	1	10%	0.344	$140	$25	$248	$0	$0	$568	$220	$325	$500	13.5	4,915.1	$893	$720
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, new develop.	67	$750	1.09	1	0%	1	$0	$0	$0	-$100	$0	$596	$226	$325	$500	73.0	4,988.1	$921	$726
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	0.081	$0	$0	$0	-$100	$0	$596	$227	$325	$500	8.8	4,997.0	$921	$727
Additional options to the right of the demand function with demand minus 900 TAF(after BMPs)																					
Urban Recycling	South Coast	Range 2	100	$750	1.09	1	0%	0.919	$0	$0	$0	-$100	$0	$596	$234	$325	$500	100.2	5,097.1	$921	$734
Active Conj. Use	Sacramento	Project 1	60	$150	1.09	0.8	10%	0.601	$140	$25	$248	$0	$0	$606	$236	$325	$500	28.3	5,125.4	$931	$736
Active Conj. Use	San Joaquin	Project 2	40	$200	1.09	1	10%	0.601	$140	$25	$248	$0	$0	$619	$238	$325	$500	23.6	5,149.0	$944	$738
Surface Storage	San Joaquin	S. Joaq. River Offstream High Yield Est.	9	$232	1.09	1	10%	0.601	$140	$0	$248	$0	$0	$626	$238	$325	$500	5.3	5,154.3	$951	$738
Active Conj. Use	Tulare	Project 1	100	$250	1.09	1	10%	0.601	$110	$25	$248	$0	$0	$639	$243	$325	$500	59.0	5,213.3	$964	$743
Surface Storage	Sacramento	Sac. River Offstream High Yield Est.	450	$248	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$640	$265	$325	$500	317.0	5,530.2	$965	$765
Urban WUE	South Coast	Reduce indoor water use from 60 to 55 gpcd	110	$800	1.09	1	0%	1	$0	$0	$0	-$100	$0	$642	$273	$325	$500	119.9	5,650.1	$967	$773
Land Fallow	San Joaquin	Range 1	12	$224	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$643	$274	$325	$500	8.5	5,658.6	$968	$774
Land Fallow	Sacramento	Range 1	10	$185	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$651	$274	$325	$500	5.6	5,664.2	$976	$774
Land Fallow	Sacramento	Range 2	28	$187	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$652	$275	$325	$500	15.8	5,680.0	$977	$775
Land Fallow	Sacramento	Range 3	32	$188	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$654	$277	$325	$500	18.0	5,698.0	$979	$777
Active Conj. Use	San Joaquin	Project 3	40	$250	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$659	$278	$325	$500	28.2	5,726.2	$994	$778
Active Conj. Use	Sacramento	Project 2	60	$200	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$669	$281	$325	$500	33.8	5,760.0	$994	$781
Land Fallow	Sacramento	Range 4	28	$206	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$676	$282	$325	$500	15.8	5,775.8	$1,001	$782
Land Fallow	Sacramento	Range 5	32	$209	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$681	$283	$325	$500	18.0	5,793.8	$1,006	$783
Land Fallow	Sacramento	Range 6	25	$215	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$688	$284	$325	$500	14.2	5,808.0	$1,013	$784
Land Fallow	San Joaquin	Range 2	12	$279	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$698	$285	$325	$500	8.5	5,816.5	$1,023	$785
Land Fallow	Sacramento	Range 7	28	$228	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$706	$286	$325	$500	15.8	5,832.2	$1,030	$786
Land Fallow	Sacramento	Range 8	32	$232	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$710	$287	$325	$500	18.0	5,850.3	$1,035	$787
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.029	$140	$25	$248	$0	$0	$720	$287	$325	$500	1.1	5,851.4	$1,045	$787
Additional options to the right of the demand function (after BMPs)																					
Active Conj. Use	San Joaquin	Project 4	40	$300	1.09	1	10%	0.688	$140	$25	$248	$0	$0	$720	$289	$325	$500	27.0	5,878.4	$1,045	$789
Land Fallow	Sacramento	Range 9	10	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$290	$325	$500	5.7	5,884.1	$1,055	$790
Land Fallow	Sacramento	Range 10	25	$248	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$730	$291	$325	$500	14.2	5,898.3	$1,055	$791
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.455	$140	$25	$248	$0	$0	$732	$292	$325	$500	21.4	5,919.7	$1,057	$792
Additional options to the right of the demand function if AC pricing is used (after BMPs)																					
Active Conj. Use	Sacramento	Project 3	60	$250	1.09	0.8	10%	0.263	$140	$25	$248	$0	$0	$732	$293	$325	$500	12.4	5,932.1	$1,057	$793
Land Fallow	Sacramento	Range 11	28	$252	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$735	$294	$325	$500	15.8	5,947.9	$1,060	$794
Land Fallow	Sacramento	Range 12	32	$256	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$740	$296	$325	$500	18.0	5,965.9	$1,065	$796
Land Fallow	San Joaquin	Range 3	12	$336	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$756	$296	$325	$500	8.5	5,974.4	$1,081	$796
Land Fallow	Sacramento	Range 13	28	$275	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$763	$298	$325	$500	15.8	5,990.1	$1,088	$798
Land Fallow	Sacramento	Range 14	32	$279	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$768	$299	$325	$500	18.0	6,008.2	$1,093	$799
Land Fallow	Sacramento	Range 15	25	$283	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$774	$300	$325	$500	14.1	6,022.2	$1,099	$800
Land Fallow	Tulare	Range 1	67	$387	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$777	$304	$325	$500	47.2	6,069.4	$1,102	$804
Active Conj. Use	Sacramento	Project 4	60	$300	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$795	$307	$325	$500	33.8	6,103.3	$1,120	$807
Additional options that meet screening criteria but are more expensive than those shown on the chart																					
Land Fallow	Sacramento	Range 16	26	$317	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$817	$308	$325	$500	14.2	6,117.4	$1,142	$808
Other	South Coast	Desalination Range 2	330	$1,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$826	$336	$325	$500	359.7	6,477.1	$1,151	$836
Land Fallow	San Joaquin	Range 4	12	$406	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$826	$337	$325	$500	8.5	6,485.6	$1,151	$837
Land Fallow	Tulare	Range 2	67	$438	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$828	$341	$325	$500	47.2	6,532.8	$1,153	$841
Land Fallow	Sacramento	Range 17	10	$355	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$864	$341	$325	$500	5.6	6,538.4	$1,189	$841
Ag WUE	Tulare	Increase efficiency, Range 2	5	$475	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$866	$341	$325	$500	3.5	6,541.9	$1,191	$841
Land Fallow	Sacramento	Range 18	25	$362	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$873	$343	$325	$500	14.1	6,556.0	$1,198	$843

D-013689

D—013689

Table 74

SUPPLY DATA FOR SCREENING LEVEL ANALYSIS, URBAN DEMAND FORECAST SENSITIVITY ANALYSIS
SOUTH COAST REGION

Type	Location	Option Measure	At Source (dry condition) Q_S Quantity (TAF/year)	At Source (dry condition) C_S Unit Cost ($/AF)	F_R Reapplication Factor	F_D Delta Loss Factor	F_B MT Brine Loss Factor	F_A Share of New Supply Factor	C_C Transport Cost	C_T Transaction Fee, $/AF	C_Q Delta Water Quality Cost, $/AF	C_R Water Use Efficiency & Recycling Avoided Cost, $/AF	C_W Wastewater Discharge Avoided Cost, $/AF	Unit Cost at Treatment Plant: Marginal Unit Cost, $/AF	Unit Cost at Treatment Plant: Average Unit Cost, $/AF	Retail Cost Additive: P_M Marginal Unit Cost $/AF	Retail Cost Additive: P_M Average Unit Cost $/AF	At Destination: Q_D Retail Quantity (TAF/year)	At Destination: Cumulative Quantity (TAF/year)	Retail Price Using: P_D Marginal Cost at Retail	Retail Price Using: P_D Average Cost at Retail
Land Fallow	San Joaquin	Range 5	21	$452	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$873	$344	$325	$500	14.8	6,570.8	$1,196	$844
Land Fallow	Tulare	Range 3	67	$490	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$881	$348	$325	$500	47.2	6,618.0	$1,206	$848
Land Fallow	Tulare	Range 4	36	$492	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$883	$350	$325	$500	25.4	6,643.4	$1,208	$850
Land Fallow	San Joaquin	Range 6	12	$483	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$904	$350	$325	$500	8.5	6,651.8	$1,229	$850
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	0.291	$0	$0	$0	-$100	$0	$917	$353	$325	$500	31.7	6,683.5	$1,242	$853
Additional options to the right of the demand function with demand plus 900 TAF(after BMPs)																					
Urban Recycling	South Coast	Range 3	100	$1,100	1.09	1	0%	0.709	$0	$0	$0	-$100	$0	$917	$359	$325	$500	77.3	6,760.8	$1,242	$859
Land Fallow	Tulare	Range 5	36	$540	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$932	$362	$325	$500	25.4	6,786.2	$1,257	$862
Land Fallow	Tulare	Range 6	67	$542	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$933	$366	$325	$500	47.2	6,833.4	$1,258	$866
Urban WUE	South Coast	Reduce indoor CII use from 3% to 5%	19	$1,125	1.09	1	0%	1	$0	$0	$0	-$100	$0	$940	$367	$325	$500	20.7	6,854.1	$1,265	$867
Land Fallow	San Joaquin	Range 7	21	$522	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$943	$369	$325	$500	14.8	6,868.9	$1,268	$869
Land Fallow	Tulare	Range 7	36	$568	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$980	$371	$325	$500	25.4	6,894.2	$1,305	$871
Land Fallow	Tulare	Range 8	67	$594	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$986	$375	$325	$500	47.2	6,941.4	$1,311	$875
Land Fallow	Tulare	Range 9	19	$607	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$999	$376	$325	$500	13.4	6,954.8	$1,324	$876
Land Fallow	San Joaquin	Range 8	21	$590	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,012	$377	$325	$500	14.8	6,969.6	$1,337	$877
Land Fallow	Tulare	Range 10	36	$635	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,027	$380	$325	$500	25.4	6,994.9	$1,352	$880
Land Fallow	Tulare	Range 11	19	$648	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,041	$381	$325	$500	13.4	7,008.3	$1,366	$881
Land Fallow	Sacramento	Range 19	10	$510	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,060	$382	$325	$500	5.6	7,014.0	$1,385	$882
Land Fallow	Tulare	Range 12	36	$683	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,076	$384	$325	$500	25.4	7,039.3	$1,401	$884
Land Fallow	Tulare	Range 13	19	$668	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,061	$385	$325	$500	13.4	7,052.7	$1,406	$885
Land Fallow	San Joaquin	Range 9	21	$659	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,062	$387	$325	$500	14.8	7,067.5	$1,407	$887
Land Fallow	San Joaquin	Range 10	13	$694	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,117	$388	$325	$500	9.2	7,076.8	$1,442	$888
Land Fallow	Tulare	Range 14	19	$730	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,123	$389	$325	$500	13.4	7,090.0	$1,448	$889
Land Fallow	San Joaquin	Range 11	21	$728	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,152	$391	$325	$500	14.8	7,104.8	$1,477	$891
Land Fallow	San Joaquin	Range 12	13	$734	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,157	$392	$325	$500	9.2	7,114.0	$1,482	$892
Land Fallow	Tulare	Range 15	19	$771	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,165	$393	$325	$500	13.4	7,127.4	$1,490	$893
Land Fallow	San Joaquin	Range 13	13	$775	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,199	$394	$325	$500	9.2	7,136.5	$1,524	$894
Land Fallow	San Joaquin	Range 14	13	$815	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,239	$395	$325	$500	9.2	7,145.7	$1,564	$895
Land Fallow	Sacramento	Range 20	10	$666	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$1,257	$396	$325	$500	5.6	7,151.3	$1,582	$896
Surface Storage	San Joaquin	Aqueduct Offstream High Yield Est.	310	$678	1.09	1	10%	0.718	$140	$0	$248	$0	$0	$1,276	$422	$325	$500	218.4	7,369.7	$1,601	$922
Land Fallow	San Joaquin	Range 15	13	$856	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,281	$423	$325	$500	9.2	7,378.8	$1,606	$923
Other	South Coast	Agriculture WUE Range 3	19	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$426	$325	$500	20.7	7,399.5	$1,609	$926
Urban Recycling	South Coast	Range 4	100	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$438	$325	$500	109.0	7,508.5	$1,609	$938
Urban Recycling	South Coast	Range 5	435	$1,500	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,284	$488	$325	$500	474.2	7,982.7	$1,609	$988
Ag WUE	Tulare	Increase efficiency, Range 3	5	$950	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,345	$489	$325	$500	3.5	7,986.2	$1,670	$989
Urban WUE	South Coast	Reduce outdoor use to 0.8 ET, exist. develop.	179	$1,650	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,422	$511	$325	$500	195.1	8,181.3	$1,747	$1,011
Urban WUE	South Coast	Reduce indoor CII use from 5% to 11%	81	$2,000	1.09	1	0%	1	$0	$0	$0	-$100	$0	$1,743	$524	$325	$500	88.3	8,269.6	$2,068	$1,024
Ag WUE	Tulare	Increase efficiency, Range 4	44	$1,500	1.09	1	10%	0.718	$110	$25	$248	$0	$0	$1,900	$529	$325	$500	31.0	8,300.6	$2,225	$1,029
Ag WUE	San Joaquin	Increase efficiency, Range 4	7	$1,500	1.09	1	10%	0.718	$140	$25	$248	$0	$0	$1,931	$530	$325	$500	4.9	8,305.5	$2,258	$1,030
Ag WUE	Sacramento	Increase efficiency, Range 4	15	$1,500	1.09	0.8	10%	0.718	$140	$25	$248	$0	$0	$2,309	$532	$325	$500	8.5	8,314.0	$2,634	$1,032

D-013690

D—013690

Appendix B

Regional Economic Impacts

APPENDIX B

Regional Economic Impacts

Both beneficial and adverse regional impacts usually result from the activities typically associated with water supply and use, including construction activities, recreation spending, municipal and industrial activity, and power production. For example:

- Water supply shortages or extremely high costs in urban areas can drive out some industries (or discourage them from coming), resulting in losses of jobs and regional income.
- A lower cost for water supply and power leaves more money in the pockets of consumers and businesses to spend on other economic activities.
- Water conservation activities often include hardware purchases from local suppliers.
- Water storage development can reduce some kinds of recreational activities and stimulate other kinds.

This appendix focuses on specific land fallowing impacts, often referred to as "third-party impacts." These are regional economic impacts that result from reductions in the water used for agricultural production. These adverse impacts are often localized, occurring in rural areas with limited economic options for those affected. As a result, they are viewed as particularly important by some groups. A more complete regional impact analysis for water management alternatives should include all categories of impacts, including those mentioned above.

The purpose of this appendix is to provide an estimate of the regional economic impacts of water management options that reduce agricultural land in production. These estimates are intended to provide another way to judge the desirability of land fallowing as a source of water to meet other demands in the state. Results were not added into the total cost of land fallowing measures displayed in this report. However, an additional profit incentive of 100 percent over MV of water was included in the cost of land fallowing. Some part of this assumed profit could be used to compensate for third-party impacts.

Third-Party Impacts

Third-party impacts potentially resulting from a water transfer or land fallowing transaction fall into two categories:

- Changes in the availability or quality of a physical resource that affect others not directly involved in the transaction. These can include: changes in flow quantity, timing, or quality in streams that received return flow from lands that are now fallow; reductions in groundwater elevation or quality resulting from a transfer of surface water out of a region; and weeds or other nuisances imposed on landowners adjacent to fallow land.

- Changes in local or regional economic activity resulting from land fallowing. This includes a reduced demand for agricultural labor, seed, fertilizer, and other inputs; reduced trucking, packing, and processing of farm products; and reduced wages and other income spent for personal consumption in the region.

This appendix estimates changes resulting from the second category of third-party impacts.

Methodology

Regional economic impacts are typically described as changes in jobs and income resulting from the implementation of some proposed action. Other related estimates can include changes in total regional economic output and fiscal impacts on local governments. Estimates provided here are from a regional economic input-output model called IMPLAN.

IMPLAN is the most widely used economic impact model. It includes a county-level database that describes the flow, measured in dollars, of goods and services among sectors in the economy. Study regions can include individual counties or any aggregation of counties. Data in IMPLAN are provided for more than 500 economic sectors, but the model allows the user to aggregate these into a smaller, more manageable number of sectors.

Once the regions and aggregate sectors are defined, IMPLAN estimates a set of economic multipliers for each region. A multiplier is the ratio of the change in income or employment from a unit change in final demand from a sector. IMPLAN estimates many different kinds of multipliers, but four are used in this analysis. Direct multipliers are used to estimate the change in income or employment from a unit change in final demand (value of production) within a sector and include only changes in that sector. Total multipliers include the direct effects plus indirect and induced changes in all economic sectors. Indirect effects include primarily the purchases of goods and services needed to produce the output from the sector. Induced effects include additional regional activity generated by workers spending the income received from the sector.

Direct and total multipliers are shown for each of two impact categories: **Total Income**, defined as wages, salaries, proprietor's income, and indirect business taxes; and **Employment**, defined in person-years. All input data and results are annual estimates.

The indirect effects estimated by IMPLAN capture so-called backward links – money paid for inputs to production from the sector. Many agricultural production sectors also provide raw product to other value-added sectors in the region, such as food processing. These forward links can add substantial additional economic value to regional crop production. The Draft PEIS for CVPIA (Reclamation, 1997) included estimates of the forward links for some key agricultural sectors, and those estimates are used here.

For this analysis, the three Central Valley agricultural regions are used to estimate and display regional impacts. Table B-1 summarizes the counties aggregated to form each of the three impact regions. Economic sectors are aggregated into 9 crop production sectors and 10 other sectors. Tables B-2, B-3, and B-4 show the sectors with their estimated income and employment multipliers for each of the three regions.

TABLE B-1
Counties Used to Estimate Aggregate Impact Multipliers

Agricultural Region	Counties
Sacramento River Region	Shasta, Tehama, Glenn, Colusa, Butte, Yuba, Sutter, Placer, Nevada, Yolo, Solano, Sacramento
San Joaquin River Region	San Joaquin, Stanislaus, Madera, Merced
Tulare Lake Region	Fresno, Kings, Tulare, Kern

TABLE B-2
Income and Employment Multipliers
Sacramento River Region

	Total Income		Employment	
	Direct	Total	Direct	Total
Livestock, Processing, Other	0.5546	1.3212	22.2	42.3
Food Grains	0.4581	1.1868	18.7	36.4
Feed Grains	0.5081	0.9898	10.2	22.2
Hay And Pasture	0.4513	1.562	34.8	62.7
Fruits	0.486	1.0937	12.7	28.7
Tree Nuts	0.5779	1.062	10.1	22.6
Vegetables	0.4748	0.9862	6.3	19.8
Sugar Crops	0.4613	1.02	10.8	24.5
Oil-Bearing Crops	0.5768	1.1439	14.8	28.6
Mining	0.4127	0.7842	5.7	13.9
Construction	0.4402	0.9624	11.1	24.6
Manufacturing	0.3582	0.7443	5.1	14.6
Transportation, Utilities	0.4951	0.8817	6.4	15.5
Trade	0.5369	1.2179	20.2	37.1
F.I.R.E.	0.5991	0.9394	5.9	13.6
Services	0.5768	1.3087	19.1	37.4
Government	0.9346	1.4199	18.5	30.7
Miscellaneous	1	1	0.0	0.0

Income multipliers are dollars of regional income change per dollar of change in final demand.

Employment multipliers are person-years of employment per million dollars (1995$) of change in final demand.

F.I.R.E. = Finance, insurance, real estate

TABLE B-3
Income and Employment Multipliers
San Joaquin River Region

	Total Income		Employment	
	Direct	Total	Direct	Total
Livestock, Processing, Other	0.4171	1.0538	20.0	37.5
Cotton	0.4684	0.8811	6.4	17.5
Food Grains	0.4212	1.1927	24.3	44.0
Feed Grains	0.5092	1.0301	14.9	28.5
Hay And Pasture	0.3627	1.5549	42.1	73.4
Fruits	0.3782	1.0053	14.0	31.6
Tree Nuts	0.4938	1.0265	11.9	26.6
Vegetables	0.5198	1.0175	8.8	22.8
Sugar Crops	0.4663	1.0485	15.6	30.7
Oil-Bearing Crops	0.6215	1.2054	20.5	35.5
Mining	0.6009	0.9262	9.7	17.9
Construction	0.4224	0.884	11.6	24.2
Manufacturing	0.2963	0.7007	5.1	16.2
Transportation, Utilities	0.5056	0.9142	8.4	18.6
Trade	0.5297	1.1405	20.9	36.9
F.I.R.E	0.6054	0.8883	5.5	12.1
Services	0.5618	1.2157	19.9	36.9
Government	0.9236	1.4329	21.8	35.3
Miscellaneous	1	1	0.0	0.0

Income multipliers are dollars of regional income change per dollar of change in final demand.

Employment multipliers are person-years of employment per million dollars (1995$) of change in final demand.

Land fallowing is assumed in this analysis to be a voluntary, willing-seller option. Any water transferred would be purchased from the current agricultural users, with any profit made becoming additional income for the region. To account for the regional impact caused by the additional income, profit from water sales was assumed to be allocated as new spending according to the personal consumption expenditure pattern in IMPLAN.

The following summarizes the regional impact estimation methodology:

- Land fallowing options developed for the screening analysis were the basis for the direct changes in final demand used as input for the IMPLAN analysis. These options provided magnitude, location, and crop mix changes.

TABLE B-4
Income and Employment Multipliers
Tulare Lake Region

	Total Income		Employment	
	Direct	Total	Direct	Total
Livestock, Processing, Other	0.5392	1.3283	34.7	57.1
Cotton	0.4709	0.8974	7.0	19.6
Food Grains	0.3835	1.0821	22.9	41.0
Feed Grains	0.4715	0.9632	14.1	27.6
Hay And Pasture	0.364	1.4109	41.9	70.4
Fruits	0.371	1.0039	14.2	33.6
Tree Nuts	0.4755	1.0099	11.9	28.1
Vegetables	0.4698	0.9952	8.5	25.3
Sugar Crops	0.4287	0.9993	15.3	31.0
Oil-Bearing Crops	0.4876	1.0385	17.6	32.1
Mining	0.5963	0.8473	5.0	10.2
Construction	0.426	0.8374	11.7	23.1
Manufacturing	0.2853	0.6929	5.5	17.4
Transportation, Utilities	0.448	0.8187	6.4	15.0
Trade	0.5251	1.057	20.7	34.6
F.I.R.E	0.6058	0.8744	5.7	12.0
Services	0.5623	1.1377	19.8	34.9
Government	0.961	1.3572	21.3	31.8
Misc.	1	1	0.0	0.0

Income multipliers are dollars of regional income change per dollar of change in final demand.

Employment multipliers are person-years of employment per million dollars (1995$) of change in final demand.

- Direct changes in the value of production were allocated between value sold by the region as raw product and value used as input to the processing sector within the region.
- New regional income from water sales was estimated using the water cost analysis and assumptions described in Chapter 5.
- IMPLAN multipliers were used to estimate income and employment impacts for land fallowing options.

Results

Supply options described in Chapter 5 include a large number of land fallowing options, but most of them are not included as preferred options in the screening analysis. Land fallowing in the Sacramento River region ranged up to 16 measures in the Environmental scenario and in the analysis of the Unconstrained scenario with Isolated Facility. Three San Joaquin River region fallowing measures and one Tulare Lake region fallowing measure were also part of these scenarios. However, several additional San Joaquin River and Tulare Lake region fallowing measures were among the next low-cost grouping.

The purpose of this regional impact assessment is to provide a general view of the magnitude of impacts associated with land fallowing, not to assess specific impacts for each scenario. Therefore, regional economic impacts from land fallowing are shown for two increments of fallowing in each Central Valley region, with each increment comprising the five lowest cost measures in that region. Two increments from each of the three regions are shown, for a total of 10 land fallowing measures in each region. The acreage of land fallowed from an increment differs among the three regions, so cross-region comparisons must be made cautiously.

Figure B-1 displays the crops likely to be fallowed from each of the increments of land fallowing. Fallowed crop acres are shown cumulatively for the regions. In the first increment analyzed, about 42,000 acres are fallowed in the Sacramento River region, 31,000 acres in the San Joaquin River region, and 123,000 acres in the Tulare Lake region. The large acreage in the Tulare Lake region occurs simply because of the way increments were defined for modeling.

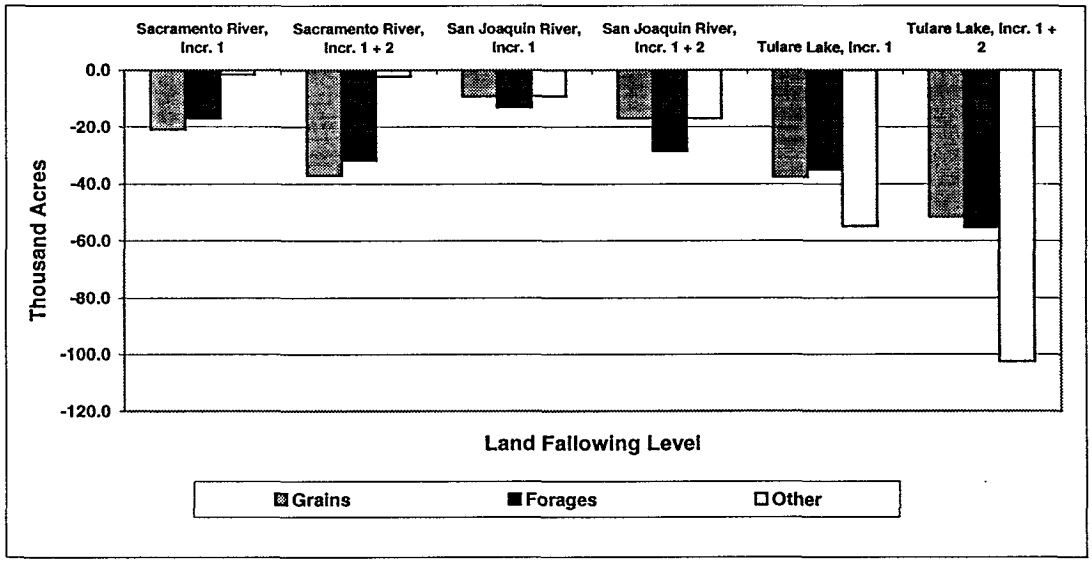

Figure B-1
Estimated Crop Mix Changes for Candidate Land Fallowing Options

In the San Joaquin River and Tulare Lake regions, cotton, forages (pasture and hay), and small grains are the primary crops estimated to be reduced. In the Sacramento River region, rice, other small grains, and forages constitute most of the fallowed crops.

Each set of impact estimates is presented in three ways: **Direct Changes** are just the impact of changes in crop output to the agricultural production and processing sectors; **Total Changes** add the indirect and induced changes in all sectors resulting from the direct changes; **Total Changes** with **New Income** also account for the offsetting effect of additional regional spending of profit from water sales.

Figure B-2 summarizes the changes in regional income (Total Income in IMPLAN) for the land fallowing increments. In the first increment, Sacramento River region income would decline about $28 million in the agricultural sector and about $68 million in total for the region. Net income from water sales would offset about $10 million of that. Similar results are estimated for the second increment of fallowing. Total impacts for both increments are estimated to be $52 million in direct and $125 million in total reduction in regional income.

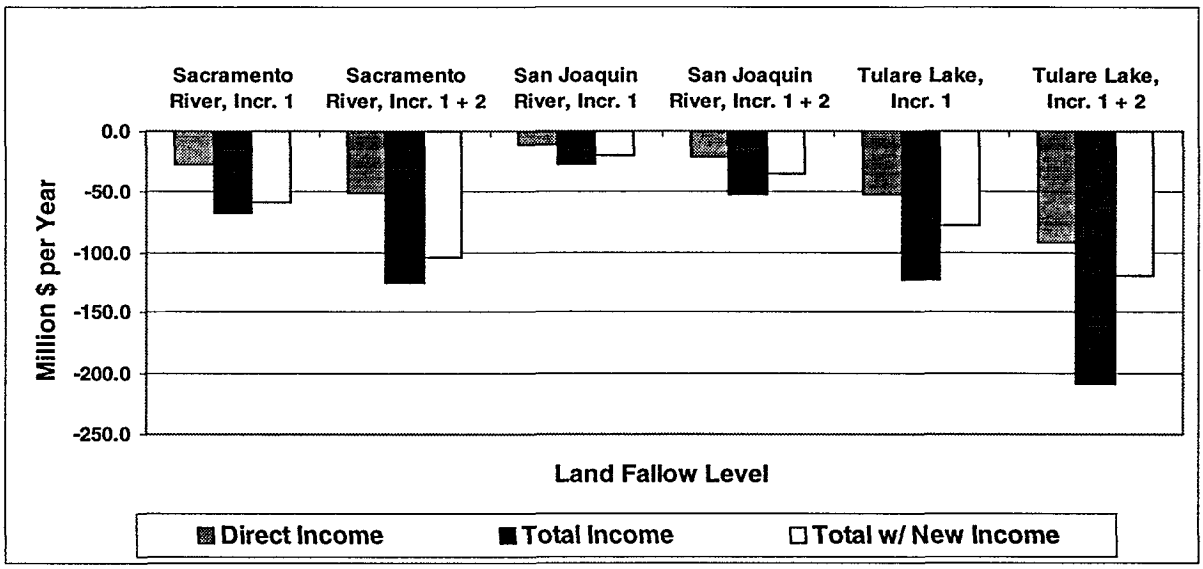

Figure B-2
Estimated Changes in Regional Income from Candidate Land Fallowing Options

In the San Joaquin River region, the first increment results in about $11 million reduction in direct income in the agricultural sector and $28 million reduction in total regional income. Net income from water sales offsets approximately one third of this total. Cumulative results of both increments are about double the impacts of increment 1 alone.

Tulare Lake region direct income declines by $53 million in the first increment. Total income declines by $123 million, offset by nearly $44 million in regional income generated by water sales. Income impacts of the second increment are not quite double those of the first.

Results for regional employment impacts are shown in Figure B-3; the results parallel those described for regional income. Sacramento River region fallowing option 1 would result in 1,100 agricultural jobs and 2,200 total jobs lost. Spending from water sales would create about 250 new jobs, predominantly in retail trade, services, and financial sectors. If both increments of fallowing were implemented, 2,100 agricultural jobs would be lost. The net reduction in regional employment, including gains from new water sales income, was estimated to exceed 3,490 jobs.

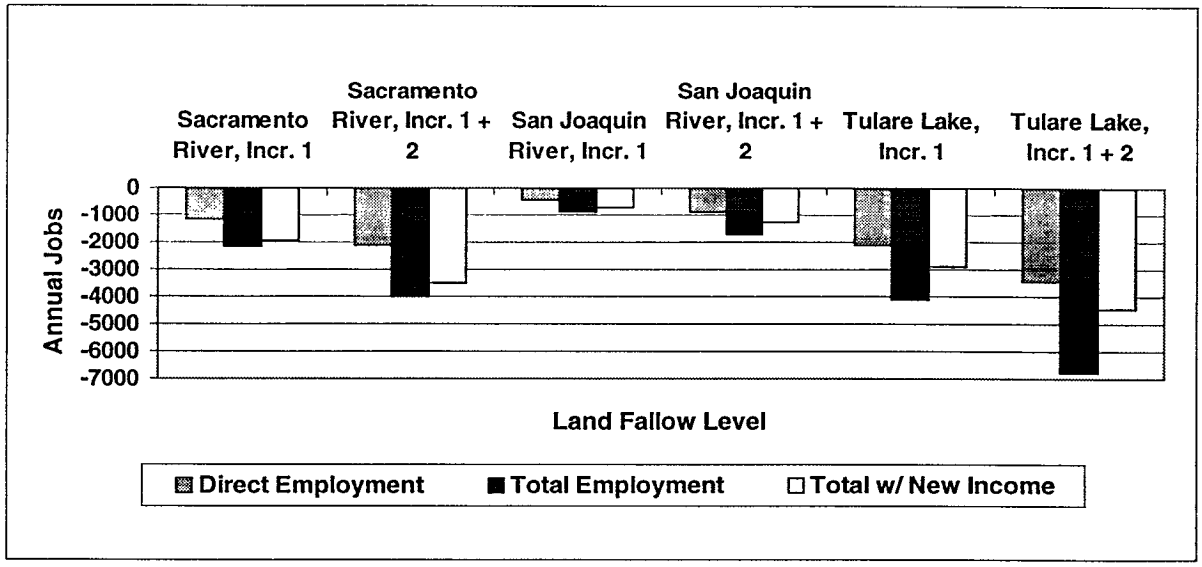

Figure B-3
Estimated Changes in Regional Employment from Candidate Land Fallowing Options

For the San Joaquin River region, about 460 agricultural jobs and 900 total jobs would be lost in the first increment of fallowing. About 200 jobs would be gained in sectors supported by spending net income from water sales, predominantly retail trade, services, and financial sectors. In the Tulare Lake region, the first increment reduces direct agricultural jobs by 2,100 and total jobs by 4,100. Spending from water sales income would generate about 1,200 jobs.

The estimates shown in the figures do not represent any particular scenario. Indeed, the land fallowing represented in the Tulare Lake region increments exceeds levels included in any scenarios.

Cumulative Impacts of Land Fallowing Options with CVPIA

CVPIA implementation and other CALFED programs are expected to affect agricultural activity, income, and jobs. The Draft PEIS for CVPIA (1997) presented the results of IMPLAN analysis of five alternatives, including No Action. Alternative 1 included implementing land retirement, (b)(2) water dedication, and water pricing. Alternative 4 added a significant amount of water acquisition, primarily in the San Joaquin River region. As explained in Chapter 4, Alternative 4 was used as a baseline for analysis here, because it included large-scale water acquisition similar to potential CALFED programs. Although the impact of some additional land fallowing options may appear acceptably small, they should be viewed in the context of cumulative implementation of both CVPIA and CALFED.

Figures B-4 and B-5 present the cumulative impacts of additional land fallowing measures, estimated as total regional losses adjusted for increases from water sales. Results are shown relative to the regional economic impacts estimated for CVPIA Alternatives 1 and 4. As an example for display, the land fallowing measures included in the analysis of the Unconstrained scenario with Isolated Facility are shown. This analysis is used because it includes the largest amount of land fallowing. Results are interpolated from the incremental impacts described above based on the actual land fallowing measures selected.

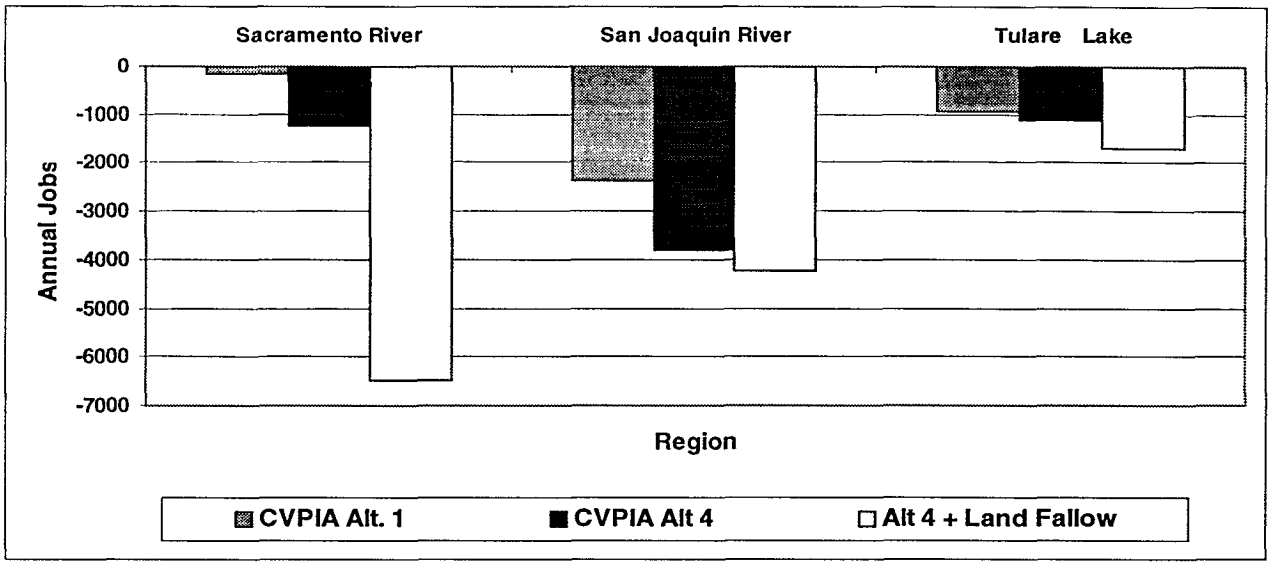

Figure B-4
Cumulative Changes in Regional Income (Unconstrained with Isolated Facility)

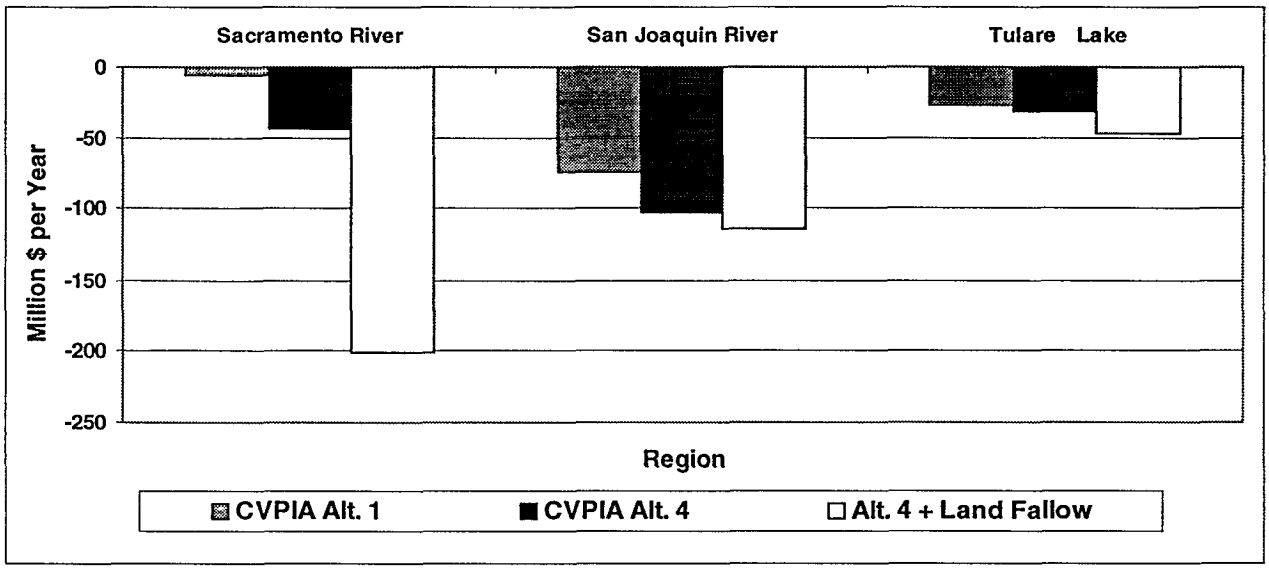

Figure B-5
Cumulative Changes in Regional Employment (Unconstrained with Isolated Facility)

Impacts are substantial in the Sacramento River region because of the large number of land fallowing measures (16) included. An additional $160 million in regional income and about 5,200 jobs are estimated to be lost due to this level of land fallowing.

Incremental results for the other two regions are relatively small, although the San Joaquin River region has already experienced large reductions in income and jobs due to CVPIA. Results for the San Joaquin River region show an estimated impact of $12 million in income

and 420 jobs from land fallowing options. Tulare Lake region income is estimated to decline by $16 million and jobs are estimated to decline by 580.

Summary of Regional Impacts of Land Fallowing Options

Land fallowing played a role similar to other supply measures in the overall mix of supplies. They are most prominent in the Unconstrained scenario with Isolated Facility and in the Environmental scenario. In these, about 100,000 acres in the Sacramento River region, 18,000 acres in the San Joaquin River region, and 29,000 acres in the Tulare Lake region are fallowed. The agricultural preference sets restricted land fallowing. Additional land fallowing appears as other low-cost measures for some of the preference sets. This means that if other kinds of measures become more costly, infeasible, or undesirable, land fallowing increase in importance.