

ATTACHMENT 1

To: Water Use Efficiency Subcommittee
From: Bennett Brooks
Subject: Quantifiable Objectives
Date: April 19, 2005

At the Water Use Efficiency Subcommittee's February meeting, participants initiated efforts to take stock of implementation of Quantifiable Objectives (QOs). As a result of the discussion, CALFED Deputy Director for Water Management Tom Gohring recommended that the Subcommittee move forward in a stepwise fashion in assessing progress to-date. Specifically, he and others recommended engaging the following questions:

- Are quantifiable objectives helping the Program meet objectives?
- How much work would it take to go forward aggressively with quantifiable objectives?
- Does the Subcommittee want to go forward with quantifiable objectives or does it prefer to try a different implementation strategy? If so, what are the alternatives?
- If the Subcommittee wishes to continue relying on quantifiable objectives, what's the best way to move forward with the effort? For example, is an incentive-driven approach reasonable?

As a first step, the Subcommittee agreed to form a work team to begin addressing the questions outlined above. The Work Team, consisting of R. Cohen, J. Lima, T. Slavin, L. Billingsley, J. Townsend, T. Manley, M. Alemi, B. Davidoff, K. Charleton, T. Gohring and M. Roberson, met April 12 to review materials assessing progress to-date.

Based on the materials presented to the Work Team (see the attached memo and table), the Work Team felt it was important to keep pursuing implementation of quantifiable objectives at this time. At the same time, the Work Team stepped out several specific strategies for facilitating effective and more aggressive QO implementation. These recommendations, now included in the updated draft WUE Program Plan, focused on the following topics:

- Better articulating each agency's role in implementing QOs;
- Engaging stakeholder in discussions on how best to incorporate QOs into the PSP process;
- Identifying ways existing technical assistance funding can be used to strengthen the QO effort; and
- Initiating an ongoing activity to analyze progress towards achieving Targeted Benefits.

Please review this document prior to Thursday's WUE Subcommittee meeting and come prepared to comment on the revisions and suggest any additional recommended changes.

MEMORANDUM DRAFT

To: WUE Subcommittee
From: DWR, USBR and CBDA
Subject: QO progress
Date: 04/19/05

ISSUE:

- Quantifiable Objectives established in the Record of Decision as foundation for agricultural water use efficiency efforts. Represented unique approach; conceptually sound but technically challenging. Milestones captured in Ag Assurances document reviewed by BD-PAC in September 2002.
- Recent WUE Subcommittee discussion on Performance Measures triggering stakeholder interest in review of progress-to-date and potential for QOs to continue serving as foundation for ag actions.

This memo covers progress to date toward QO implementation by the CBDA, DWR, AWMC and Reclamation. This memo contains two basic sections – a summary of effort by QO and a summary of effort by implementing agency.

I. Summary by Quantifiable Objective

A general listing off all Targeted Benefits (QO) and progress toward them is given in Table 1. The table lists the Targeted Benefits by sub-region, their category (in-stream flow and timing, water quality and water quantity), the quantifiable objective (QO) and information about effort to date. The **Address** column indicates if any applicant or agency has made an effort toward the TB (QO), the **Expected Benefit** states what the applicant has proposed to achieve toward the QO and the **Progress** represents actual projects results toward the QO. Data for this table was taken from the 2005 WUE Prop 50 PSP and from SB 23 results. The table will be updated as more information is obtained.

Table 1 is attached after the memo (page14)

II. CBDA

The Authorities role is to provide oversight and coordination on program implementation. The CBDA has participated along with DWR and the AWMC in the incorporation of QO into the Net Benefit Analysis, promoted the inclusion of QO into the 2004 WUE Prop 50 PSP, provided technical support to Reclamation for the QO language for their planning documents. The CBDA has updated the cost and performance information for the economic portion of the QO development and provide technical assistance for several WUE PSP applicants. In addition the CBDA has participated in the review of WUE PSP applications.

III. DWR

DWR role [to be provided as handout at meeting]

A. 2004 PSP Applications

A general summary of the applications received for the 2005 WUE Prop 50 is shown in Table D1. Direct¹ benefits are project outcomes that contribute to a CALFED Water Use Efficiency objective within the Bay-Delta system. Indirect² benefits are project outcomes that help to reduce dependency on the Bay-Delta related system or improve a region's water supply reliability and quality. Verification of objectives is based on staff analysis of the applications and represents the degree that the applicant "follows the water". Applicants that can trace the water to the diversion are classified as specific those that estimate that the project will result in a benefit are classified as general.

¹ For example, a direct benefit contributes toward a stated Quantifiable Objective for in-stream flow and timing.

² For example, through project implementation an agency can delay the need for additional deliveries from the Bay-Delta system.

Table D1. General Summary of the 2005 WUE Prop 50 applications.

Summary of 2005 WUE Prop Applications					
	Count	Requested	Applicant	Total	² Benefit
		\$	\$	\$	AF/yr
Total Applications	60	44,334,849	12,832,720	56,996,290	
Implementation Applications	14	20,438,303	5,664,826	26,103,128	
Research, Feasibility, Pilot Applications	46	23,896,546	7,167,894	30,893,162	
Applications Addressing QO	32	26,374,546	6,948,248	33,322,794	
¹ Applicants with Direct Benefit	17				
¹ Applicants with Indirect Benefit	43				
¹ Specific Verification of Objectives	11				29,633
¹ General Verification of Objectives	26				11,380
¹ No Verification of Objectives	23				

¹ Based on staff review of PSP

² Staff reporting of average value claimed

A general summary of how are QO are represented in the applications received for the 2005 WUE Prop 50 is shown in Table D2. Research, Feasibility and Pilot projects listed as specific verification are based on the specificity of the effort toward the QO

Table D2. Summary of QOs in the 2005 WUE Prop 50 applications.

Summary of Quantifiable Objectives in the 2005 WUE Prop 50 PSP applications.

¹ Verification	Type of Project	Benefit Type	Count of QO Type			Region
			In-stream	Quality	Quantity	
Specific	Implementation	Direct	4	4	5	SV
	Research, Feasibility, Pilot		6	2	0	most SV, SJV
	Implementation	Indirect	0	0	4	Tulare
General	Implementation	Direct	2	9	2	SJV
	Research, Feasibility, Pilot		6	0	8	SV
	Implementation	Indirect	2	3	3	SV & SJV
	Research, Feasibility, Pilot		4	5	12	SV & SJV

¹ Refers to the type of Monitoring and Evaluation applicant has proposed and interpreted by staff review of application.

IV. RECLAMATION

Reclamation's role is to provide guidance to CVP contractors for responding to the QOs. All CVP agricultural and refuge contractors who are required to submit Water Management Plans under their respective Criteria are required to review and respond to QO that are applicable to their service area. There are three documents that are used for this – Standard Criteria for Evaluating Water Management Plans, - Regional Criteria for Evaluating Water Management Plans for the Sacramento River Contractors and the Criteria for Developing Refuge Water Management Plan. Pertinent excerpts from each document are given below along with a statement about progress to date.

A. Standard Criteria for Evaluating Water Management Plans

Under Section 5 of the Bureau of Reclamation, Mid-Pacific Region Standard Criteria for Evaluating Water Management Plans, there is a requirement to report on plan implementation. The following is the general direction given to preparers:

Section 5: Plan Implementation

Water Management in general, and Water Management planning in particular, is an on-going process that starts with the preparation of a comprehensive Plan. The purpose of preparing a Plan is for the Contractor to implement the programs developed during the planning process. Implementation of programs identified in the Plan is critical to the success of Water Management within a District. The Criteria focus not only on what constitutes an adequate Plan, but also on the Implementation of the programs described in that Plan.

If there are CALFED Quantifiable Objectives (QOs) that apply to the geographic location of your district lands, identify the QOs that apply to the District and comment on potential for Contractor participation (see Attachment C for more information).

Pursuant to water service and settlement contract terms, Contractors must report on Plan Implementation annually. Agricultural Contractors can complete an annual update by filling in the information for BMPs on the WaterShare website at <http://watershare.mp.usbr.gov/>.

In addition to the above information the following instructions are in Attachment C

Attachment C *Assess QOs*

CALFED is developing QOs that provide incentives for participation by water users including contractors in water management activities. These activities may or may not directly benefit the water user/contractor. If there are CALFED QOs that apply to the geographic location of your agency lands, identify the QOs that apply to your agency and comment on the potential for contractor participation. Evaluate and comment on any BMP or practice that is complementary, or could be complementary to the QOs identified in the district's service area. To see if your agency has QOs that apply, please refer to the section in the back of the planner entitled, "QOs by Agency." Find your agency in the alphabetical list. Review the QOs listed for your agency and comment on your agency's interest in obtaining funding to address the QO. Evaluate and comment on any BMP or practice that is complementary or could be complementary to the QOs in the district.

A sample of the Attachment C by agency is given below. This listing is available for all CVP contractors that are required to complete a plan.

Sample of QO listing by agency taken from Attachment C of the USBR Standard Criteria.

Quantifiable Objectives (QOs) by Agency
Details are listed at: http://calfed.ca.gov/current/quantifiable_objectives.html

Water Supplier (1)	Description of the CALFED Objective (2)	Location (3)	Sub-Region Number	Targeted Benefit Number
ALPAUGH IRRIGATION DISTRICT (ID)	Decrease flows to salt sinks to increase the water supply for beneficial uses.	All affected lands	15	167
	Provide long-term diversion flexibility to increase the water supply for beneficial uses.	Kern NWR (NWR)	19	191
	Provide long-term diversion flexibility to increase the water supply for beneficial uses.	Pixley NWR	18	186
	Provide long-term diversion flexibility to increase the water supply for beneficial uses.	Salt affected soils	15	170

To date 10 responses to the criteria are available with the following break down: 4 with a positive outlook toward participation, 5 with comments that convey they see no potential for participation and one indicated that they already do things related to the QOs. Several CVP contractors applied for the 2005 Prop 50 WUE PSP funding.

B. Regional Criteria for Evaluating Water Management Plans for the Sacramento River Contractors

The Regional Criteria requires participating Sacramento River CVP contractors to prepare a Regional Plan that includes the QO. This plan is due June 2005. The following is taken from the Regional Criteria.

Section 4: Analyze Water Management QOs

Intent: Analyze the QOs identified by the CALFED Water Use Efficiency Program that will support improved (more efficient) Water Management in the Region served by the Participating Contractors. The Participating Contractors will review the list of applicable QOs. Where Participating Contractors identify QOs that are not applicable, the Participating Contractors will determine their non-applicability by the initial Annual Update (see the “Determination of Non-Applicability” paragraph in this section).

Evaluation: In certain circumstances, specific information may not be available. For these circumstances, the Plan will describe for the initial Annual Update how the information will be obtained including an associated timeline for completion.

Detail Expected in an Adequate Plan: This section addresses the Participating Contractors’ review of the QOs that apply to the geographic location of the Region served by the Participating Contractors and that are within the management purview of the Participating Contractors. The CALFED QOs that have been quantified as of the date of these Regional Criteria are identified in Appendix A, attached hereto. In this section, the Participating Contractors will identify any QOs that they determine are not applicable and provide an analysis including, at a minimum, a statement of reasons for any such determination. The Participating Contractors will evaluate each of the remaining QOs to identify all or a portion of the QO that they propose to analyze for potential Implementation (Proposed QOs). For data not available during the preparation of this Plan, the Participating Contractors shall describe in the Plan how this information will be obtained for the initial Annual Update.

Background Regarding TBs and QOs: The TBs and the QOs are the cornerstone for the Implementation of agricultural water use efficiency element of the CALFED Program. The TBs are geographically specific in-stream flow and timing, water quality, and water quantity benefits that can potentially and partially be met through irrigation Water Management. The QOs are the CALFED Program’s approximation, expressed in acre-feet, of the practical, cost-effective portion of a TB that can be achieved through improving irrigation Water Management. These approximations, have been made for agricultural water users across a Sub-region, and do not necessarily represent the economically feasible portion of a TB that could be achieved at the local agency level.

The CALFED Program’s TBs for the Central Valley are organized in relation to 21 Sub-regions. The seven Sub-regions covered under these Regional Criteria are set forth below:

Table 1.
Names and numbers of the CALFED Program Sub-regions relative to the area served under this Regional Criteria Document.

Sub-region Name	WUE Sub-region Number
Redding Basin	1
Sacramento Valley, Chico Landing to Red Bluff	2
Sacramento Valley, Colusa Basin	3
Mid-Sacramento Valley, Chico Landing to Knights Landing	4
Sacramento Valley Floor, Cache Creek, Putah Creek and Yolo Bypass	6
Lower Sacramento River below Verona	7

Determination of Non-Applicability: In certain cases, the Participating Contractors in consultation with Reclamation, may determine the QOs to be "non-applicable." A determination of non-applicability could include, but will not be limited to, the following:

- Whether the QOs are already being pursued through other regional Implementation activities (duplicated effort).
- Whether the Participating Contractors in the Sub-region are unable to affect the related TBs (ineffectiveness).
- Whether the CALFED Science Program has determined that the QO and/or its related TB are no longer warranted based on information collected through the Region's Water Flow and Water Quality Monitoring Program, or the Science Program's determination that the fishery conditions in the Region have been satisfied (no longer necessary).

Prioritization of QOs for Further Analysis and Quantification of

Proposed QOs: After the determination is made of which QO's are not applicable, the Participating Contractors will evaluate the remaining QOs to identify Proposed QOs. As part of this evaluation process, the Participating Contractors will:

- Provide a preliminary prioritization of the Proposed QOs based upon the following considerations: Potential for greatest local benefit,

potential benefit to the CALFED Program, utilization of other on-going analyses, practicality of Implementation, and local environment.

- Annually analyze, at a minimum, one-fifth of the Proposed QOs to determine which Proposed QOs may be implemented. This information will be provided in the Annual Update. At least one Proposed QO should be analyzed for each Sub-region unless all QOs for that Sub-region have already been addressed. The scope and extent of the analysis of each Proposed QO will be dependent upon whether undertaking such analysis is financially feasible for the Participating Contractors based upon their existing resources, and if not, whether there is funding available to the Participating Contractors for that purpose. If undertaking an in-depth and detailed analysis of the Proposed QO is not financially feasible, and funding is not currently available, the Plan shall at a minimum, provide a reconnaissance level analysis. Such an analysis will be based upon existing data and information, including data presented in the Participating Contractors' water inventory (Section 2). In addition, the Plan shall identify in the Annual Update the efforts that the Participating Contractors will undertake in order to attempt to secure adequate funding to perform a detailed and in-depth analysis of the Proposed QO.

Section 5: Identify Actions to Implement and Achieve Proposed QOs

Intent: Develop a Water Management Implementation Plan that demonstrates a reasonable approach for implementing actions that will meet the Proposed QOs identified by the Participating Contractors in Section 4, as well as other actions that address the efficient Water Management objectives in the Region. Implementation of any Proposed QOs will be dependent upon whether such Implementation is economically and financially feasible for each of the Participating Contractors.

The types of actions that can be undertaken to address the TBs and the Proposed QOs include, but are not limited to, actions outlined in the BMPs for agricultural contractors in Reclamation's Standard Criteria.

Evaluation: In certain circumstances, specific information may not be available. For these circumstances, the Plan will describe in the initial Annual Update how the information will be obtained including an associated timeline for completion of the analysis.

Detail Expected in an Adequate Plan: This section will describe the particular actions that will be undertaken by each of the Participating Contractors to pursue the Proposed QOs developed as a result of the efforts described in Section 4. Alternatively, this section will identify in the initial

Annual Update a process that the Participating Contractors will undertake and complete in order to develop a Water Management Implementation Plan that demonstrates a reasonable approach for implementing actions that will meet the applicable Proposed QOs. For data not available during the preparation of this Plan, the Participating Contractors will describe in the initial Annual Update how the information will be obtained.

Development of the Implementation Plan for Selected Proposed QOs:
The Participating Contractors should develop the Implementation Plan as follows:

- Develop a set of actions to accomplish each of the Proposed QOs that have been analyzed and identified for Implementation in Section 4. The Participating Contractors will select the most effective and reasonable practices or measures to accomplish the Proposed QOs. Measures that should be considered include improved grower education and Implementation of appropriate pricing and measurement requirements (based upon ongoing current cooperative studies) to encourage efficient Water Management. In addition, the Participating Contractors are also encouraged to explore and implement other potentially feasible practices that lead to efficient Water Management improvements in the Region.
- Identify each action and describe the Implementation process, including each of the Participating Contractor's involvement in carrying out the actions.
- Provide an analysis of the proposed actions, including potential impacts (e.g., environmental); costs, as well as opportunities for partnerships; an explanation for choosing the proposed actions; and the priority of the actions. In evaluating the potential actions, the Participating Contractors should consider opportunities for benefits that accrue only with a regional approach and/or as a result of partnership(s) with other entities.

Economic and Financial Feasibility: Implementation of any Proposed QOs will be dependent upon whether such Implementation is economically and financially feasible for the Participating Contractors based upon their existing resources, and if not, whether there is funding available to the Participating Contractors for that purpose. If such Implementation is not economically feasible, and funding is not currently available, the Plan shall identify in the Annual Update the efforts that the Participating Contractors will undertake in order to attempt to secure adequate funding.

Section 6: Establish Monitoring Program

Each of the Participating Contractors will work with Reclamation to implement measurements at strategic points to document existing conditions, and therefore, to monitor anticipated benefits resulting from the Implementation of the programs.

Intent: Document existing conditions for flows and water quality constituents for the selected QOs for key outflow locations in the Sub-regions and update these conditions annually. Measure the physical results of actions taken and collect other data necessary to assess progress toward achieving the QOs. Monitoring is also intended to provide to Participating Contractors both timely and accurate information on the quantitative impacts of their water use, and thus, an indication of how effective individual actions have been.

Evaluation: In certain circumstances, specific information may not be available. For these circumstances, the Plan will describe in the Annual Update how the information will be obtained including the associated timeline for completion. Factors which Reclamation can use to evaluate the monitoring program may include: Sampling frequency and technique, reporting format, analytical methodology, target constituents (or actions), and units of measurement.

Detail Expected in an Adequate Plan: This section will describe a mutually acceptable monitoring program for Implementation. Alternatively, this section shall identify in the initial Annual Update a process for developing a monitoring plan. The Participating Contractors will begin implementing the mutually acceptable monitoring plan developed by the Participating Contractors prior to the second Annual Update.

The monitoring program will include: (1) Specific monitoring (as appropriate) for each objective; (2) schedule, budget, and responsibility for monitoring; and (3) annual reporting requirements.

When finalized, the participants in the watershed group's program identified in Section 1, may satisfy all, or a portion of, this monitoring plan to the extent that the program addresses the flow and water quality constituents for the key outflow locations in the Sub-regions.

The Sacramento Valley Regional Plan is due June 2005.

C. Criteria for Developing Refuge Water Management Plan

The Criteria for Developing Refuge Water Management Plans (Refuge Criteria) provides a common methodology, or standard, for efficient use of water by Federal Wildlife Refuges, State wildlife management areas and resource

conservation districts that receive water under provisions of the Central Valley Project Improvement Act (CVPIA). They document the process and format by which Refuge Water Management Plans (Refuge Plan) should be prepared and submitted to Reclamation as part of the Refuge/District Water Supply Contracts and Memorandum of Agreements.

The following is taken from: Section I. Exemptible BMPs.

For each exemptible BMP, report on the proposed Implementation schedule for 5 years and the estimated direct and indirect costs. Where appropriate, report the location, size, reason, and anticipated benefit of the proposed improvements. If the Refuge will study a BMP or conduct a pilot project describe the projected program and timeline. If any of the exemptible BMPs will not be implemented within 2 years of submitting this Refuge Plan describe the projected program, timeline, and other relevant information.

10. CALFED Provide a short narrative describing past, present, or future plans that address the CALFED Water Use Efficiency Program goals identified for this Refuge. Respond only to questions for your specific Refuge.

Sacramento and Delevan National Wildlife Refuges (NWRs)

1. Describe actions that reduce the salinity of surface return water. (Targeted Benefit (TB) 24)
2. Describe actions that reduce nonproductive ET. (TB 25)

Colusa and Sutter NWR's

1. Describe actions that reduce nonproductive ET. (TB 33)

Gray Lodge State Wildlife Area (WA)

1. Describe actions that reduce nonproductive ET. (TB 46)

North Grassland, Volta, and Los Banos WA's

1. Describe actions that reduce selenium concentration in the Grassland Marshes. Reduce selenium concentration to 5 ug/L in the Grassland Marshes. (TB 95)
2. Describe actions that reduce San Joaquin River selenium and boron concentrations. Reduce San Joaquin River selenium concentration to 5 ug/L and boron concentration to 2 mg/L from March 15 to September 15 and to 2.6 mg/L September 16 to March 14. (TB 98)
3. Describe actions that reduce salinity in the Grassland Marshes and Mud and Salt Sloughs. Reduce salinity in the Grassland Marshes and Mud and Salt Sloughs. (TB 102, 103).

4. Describe actions that reduce nonproductive ET. Reduce unwanted ET. (TB 107)

San Luis and Kesterson NWR's, Grassland Resource Conservation District

1. Describe actions that reduce salinity in the San Joaquin River, Grassland Marshes, and Mud and Salt Sloughs. (TB 95, 96, 98)

2. Describe actions that reduce salinity in the Grassland Marshes and Mud and Salt Sloughs. (TB 102, 103, 104) (All of these six contaminant TBs could be incorporated into one Refuge manager response, e.g. addressed through the Grassland Drainage Program).

3. Describe actions that reduce nonproductive ET. (TB 107)

Merced NWR

1. Describe actions that provide additional flow to San Joaquin River. (TB 148)

2. Describe actions that reduce salinity at Vernalis. (TB 154)

3. Describe actions that reduce nonproductive ET. (TB 157)

Mendota WA

1. Describe actions that reduce flows to salt sink. (TB 167)

2. Describe actions that reduce nonproductive ET. Reduce unwanted ET. (TB 168)

Kern NWR

1. Describe actions that reduce nonproductive ET. (TB 189)

Currently there are no plans available with the CALFED BMP to analyze. It is expected that the first set of plans that include this BMP will be available XXXXX.

D. Early Implementation Projects

Beginning in 2000 Reclamation funded the following projects in support of the QOs. These projects are considered early implementation with outcomes to be used to adaptively manage program implementation.

USBR funded early implementaio projects

Project	Amount	Outcome
	\$	
QO Rapid Appraisal		Guide for how water suppliers appraise their capacity to pursue Qos
Evaporation of Irrigated Lands		Assessment of evaporation potential to support ET reduction TB
Monitoring and Evaluation		Guide for grant applicant to use to quantify their efforts.
Regulated deficit irrigation		Results due by Nov 2005; will establish research sites
Remote sensing		Results due by Nov 2005: will quantify RDI savings
Mobile Labs		No results submitted
Yolo RCD		Pilot projects and implementation strategies

V. Agricultural Water Management Council

Served as project manager to incorporate the QO into the Net Benefit Analysis. The Council served as the project manager to incorporate the QOs into the Net Benefit Analysis (NBA) for implementation of efficient water management practices. At the onset of the project it was quickly discovered that the QOs could not easily be incorporated into the NBA structure. Each district has a unique listing of QOs that are directly and indirectly applicable to their service area. The structure of the NBA evaluates the impacts of EWMP implementation to the district, the environment, and other third parties including the effects of multiple EWMP implementation. An additional analytical structure needs yet to be developed to assess the effects of EWMP implementation on the QOs, including the potential adverse effects from EWMP implementation, as well as a structure to assess the impacts from implementing multiple EWMPs. The Council selected four districts to serve as beta testers to develop and document a methodology for analyzing the relationship between EWMPs and QOs. The methodology is currently available as a reference for water suppliers to perform their own analyses.

The Agricultural Water Management Council supports implementation of the CALFED Agricultural Water Use Efficiency Program and has worked to increase water supplier awareness and comprehension of the Targeted Benefits and

Quantifiable Objectives. Throughout the past few years the Council has sponsored workshops and presentations in conjunction with the quarterly Council meetings to review the purpose, definition and relevance of Targeted Benefits and QO to the water supplier. Handouts with specific examples on how Targeted Benefits and QO could be applied to district operations and water use efficiency projects are distributed at meetings and mailed to members. In August 2004, a listing was mailed to each member that identified the corresponding Targeted Benefits and QO to their service area with a one-page fact sheet on how participation in the WUE program could benefit their district through available grant opportunities. The Council continues to investigate opportunities and projects that can continue to improve overall comprehension of the Targeted Benefits and QO.

Quantifiable Objective
CALFED Ag WUE

Table 1. Summary of all Targeted Benefits (QO) and progress to date.

Sub-Region	TB#	Location	Category	QO	Address	Expected Benefit	Progress
					Funding Source P = project; F = feasibility, study or research		
1. Redding Basin	1	Battle Creek	Flow	TBD			
	2	Bear Creek	Flow	TBD			
	3	Clear Creek	Flow	TBD			
	4	Cottonwood Creek	Flow	TBD			
	5	Cow Creek	Flow	TBD	P50 F		
	6	Sacramento River below Keswick	Flow	44 - 180 TAF/yr	SB 23 F, Prop 50 F	20,000 AF/yr	
	7	All affected lands	Quantity	6.5 TAF	P50 F/P	20,000 AF/yr	
	8	All suitable lands	Quantity	TBD	P50 F/P	20,000 AF/yr	
2. Sacramento Valley, Chico Landing to Red Bluff	9	Antelope Creek	Flow	TBD			
	10	Deer Creek	Flow	TBD	P50 F/P	1,700/ F 13,000 AF/yr	
	11	Mill Creek	Flow	TBD			
	12	Paynes Creek	Flow	TBD			
	13	Sacramento River below Keswick	Flow	44 - 180 TAF/yr	SB 23 F, Prop 50 F	30,000 AF/yr	
	14	Elder Creek	Quality	TBD			
	15	Sacramento River	Quality	TBD			
	16	Deer Creek	Quality	TBD	P50 F/P	Temp imp	
	17	Mill Creek	Quality	TBD			
	18	All affected lands	Quantity	6.5 TAF			
3. Sacramento Valley, Colusa Basin	19	All suitable lands	Quantity	TBD			
	20	Sacramento River below Keswick	Flow	44 - 180 TAF/yr	SB 23 F, Prop 50 F	30,000 AF/yr	
	21	Colusa Basin	Quality	TBD			
	22	Colusa Drain	Quality	TBD			
	23	Sacramento River	Quality	TBD			
	24	Colusa Basin	Quality	TBD	P50 F		
	25	All affected lands	Quantity	5.1 TAF/Yr	P50 F		
	26	All suitable lands	Quantity	TBD	P50 F		
	27	Wetlands	Quantity	7.9 TAF/yr	SB 23 F, Prop 50 F	30,000 AF/yr	
	28	Sacramento & Delevan National Wildlife Refuge	Quantity	TBD			
4. Mid-Sacramento Valley, Chico Landing to Knight's Landing	29	Salt affected soils	Quantity	TBD			
	30	Sacramento River below Keswick	Flow	44 - 180 TAF/yr	SB 23 F, Prop 50 F	30,000 & 5,000 AF/yr	
	31	Sacramento River	Quality	TBD	P50 F		
	32	Colusa Drain	Quality	TBD			
	33	All affected lands	Quantity	4.6 TAF	P50 P/F		
	34	All suitable lands	Quantity	TBD	P50 F		
	35	Wetlands	Quantity	4.5 TAF/yr	P50 F		
	36	Colusa & Sutter National Wildlife Refuge	Quantity	TBD	P50 F		

Quantifiable Objective
CALFED Ag WUE

Table 1. Summary of all Targeted Benefits (QO) and progress to date.

Sub-Region	TB#	Location	Category	QO	Address	Expected Benefit	Progress
					Funding Source P = project; F = feasibility, study or research		
5. Lower Feather River and Yuba River	37	Butte Creek	Flow	TBD			
	38	Feather River	Flow	2.9 - 54 TAF/yr	SB 23 P, P50 P/F	5,815 AF/yr	695 AF/YR
	39	Yuba River	Flow	1 - 5.6 TAF/yr			
	40	Feather River	Quality	TBD			
	41	Feather River	Quality	TBD			
	42	Sacramento Slough near Verona	Quality	TBD	P50 F		
	43	Butte Creek	Quality	TBD			
	44	Feather River	Quality	TBD	P50 F		
	45	Yuba River	Quality	TBD			
	46	All affected lands	Quantity	11.1 TAF/yr	P50 F		
	47	All suitable lands	Quantity	TBD	P50 F		
6. Sacramento Valley Floor, Cache Creek and Putah Creek and Yolo Bypass	48	Wetlands	Quantity	10.5 TAF/yr			
	49	Graylodge Wildlife Mgmt Area	Quantity	TBD			
	50	Cache & Putah Creeks	Flow	TBD	SB 23 P		
	51	All suitable lands	Quantity	TBD	SB 23 P		
	52	Sacramento River	Quality	TBD	P50 F		
7. Lower Sacramento River below Verona	53	All affected lands	Quantity	5 TAF/yr	P50 F		
	54	Wetlands	Quantity	<1 TAF/yr			
	55	American River	Flow	1.8 - 31.2 TAF/yr			
	56	Bear River	Flow	59.5 - 93.2 TAF/yr			
	57	Sacramento River below Keswick	Flow	44 - 180 TAF/yr			
	58	Natomas East Main Drain	Quality	TBD			
	59	Sacramento River	Quality	TBD			
	60	Natomas Drain	Quality	TBD			
	61	American River	Quality	TBD			
	62	Bear River	Quality	TBD			
63	All affected lands	Quantity	<1 TAF/yr				
	64	All suitable lands	Quantity	TBD			
	65	Wetlands	Quantity	1 TAF/yr			

Quantifiable Objective
CALFED Ag WUE

Table 1. Summary of all Targeted Benefits (QO) and progress to date.

Sub-Region	TB#	Location	Category	QO	Address	Expected Benefit	Progress
					Funding Source P = project; F = feasibility, study or research		
8. Valley Floor east of Delta	67	Cosumnes River	Flow	0.6 - 1.5 TAF/yr			
	68	Mokelumne River	Flow	2.3 TAF/yr			
	69	Calaveras River	Quality	TBD			
	70	Mokelumne River	Quality	TBD			
	71	All affected lands	Quantity	8.3 TAF/yr			
	72	All suitable lands	Quantity	TBD			
	73	Wetlands	Quantity	<1 TAF/yr			
9. Sacramento-San Joaquin Delta	74	Delta	Flow	TBD			
	75	Sacramento River below Keswick	Flow	44 - 180 TAF/yr	SB F		
	76	Western Delta	Flow	TBD	SB 23 P		380 AF/YR
	77	Delta	Quality	TBD			
	78	Delta	Quality	TBD			
	79	San Joaquin River	Quality	TBD			
	80	Delta	Quality	TBD			
	81	Delta	Quality	TBD	P50 P, P13	700 T SED, 2500 T SALT	
	82	San Joaquin River	Quality	TBD			
	83	Sacramento Slough	Quality	TBD			
	84	Delta	Quality	TBD	P13		
	85	Sacramento River	Quality	TBD			
	86	Delta	Quality	TBD			
	87	All affected lands	Quantity	TBD	P13		
88	All affected lands	Quantity	6.6 TAF/yr				
89	Wetlands	Quantity	5 TAF/yr				
90	Salt affected soils	Quantity	TBD	SB 23 P	2,500 AF/YR		
91	All suitable lands	Quantity	TBD				

Quantifiable Objective
CALFED Ag WUE

Table 1. Summary of all Targeted Benefits (QO) and progress to date.

Sub-Region	TB#	Location	Category	QO	Address	Expected Benefit	Progress
					Funding Source P = project; F = feasibility, study or research		
10. Valley Floor west of San Joaquin River	92	West San Joaquin Tributaries	Flow	TBD			
	93	San Joaquin River	Quality	TBD			
	95	Grassland Marshes	Quality	TBD			
	96	Mud and Salt Slough	Quality	TBD			
	97	Mud Slough	Quality	TBD			
	98	San Joaquin River	Quality	TBD	SB 23 P	700 T SED, 2500 T SALT	
	99	Salt Slough	Quality	TBD			
	100	Orestimba Creek	Quality	TBD	X		
	101	San Joaquin River	Quality	TBD	SB 23 P	700 T SED, 2500 T SALT	
	102	Grassland Marshes	Quality	TBD	X		
	103	Mud and Salt Slough	Quality	TBD			
	104	S. Joaq. Rr at Vernalis	Quality	TBD	SB 23 P	2,500 AF/YR	
	106	All affected lands	Quantity	49 - 111 TAF/yr	SB 23 P/F, P50 F	1,360 AF/yr P, 3,500 AF/YR F	
	107	All affected lands	Quantity	8.7 TAF/yr	SB 23 P	1,360 AF/yr	
	108	All suitable lands	Quantity	2.3 TAF/yr	P50 F	590 AF/YR	
109	Salt affected soils	Quantity	TBD				
110	Wetlands	Quantity	TBD				
111	Specific managed wetlands	Quantity	TBD				

Quantifiable Objective
CALFED Ag WUE

Table 1. Summary of all Targeted Benefits (QO) and progress to date.

Sub-Region	TB#	Location	Category	QO	Address	Expected Benefit	Progress
					Funding Source P = project; F = feasibility, study or research		
11. Eastern San Joaquin Valley above Tuolumne River	112	San Joaquin River	Flow	TBD	SB 23 P		857 AF/YR
	113	Stanislaus River	Flow	14 - 129.1 TAF/yr	SB 23 P, P50 P	1,360 AF/yr, 3,000 AF/YR	
	114	Tuolumne River	Flow	13 - 43.3 TAF/yr	SB 23 P, P50 P	1,360 AF/yr	
	115	San Joaq. Rr	Quality	TBD			
	116	Stanislaus River	Quality	TBD	P50 P		
	117	Tuolomne River	Quality	TBD			
	118	Harding Drain	Quality	TBD			
	119	Harding Drain	Quality	TBD			
	120	San Joaquin River	Quality	TBD			
	121	Stanislaus River	Quality	TBD	P50 P		
	122	Tuolumne River	Quality	TBD			
	123	S. Joaq. Rr at Vernalis	Quality	TBD	P50 P		
	124	San Joaq. Rr	Quality	TBD			
	125	Stanislaus River	Quality	TBD	P50 P		
	126	Tuolomne River	Quality	TBD			
	127	All affected lands	Quantity	7.5 TAF/Yr	SB 23 P, P50 F	1,360 AF/yr	
	128	All suitable lands	Quantity	TBD			
	129	Wetlands	Quantity	TBD			
	12. Eastern Valley Floor between Merced River and Tuolumne River	130	Merced River	Flow	1.9 TAF/yr	SB 23, P50	1,360 AF/yr
131		San Joaq. Rr	Flow	TBD			
132		Tuolumne River	Flow	13 - 43.3 TAF/yr			
133		Merced River	Quality	TBD			
134		San Joaq. Rr	Quality	TBD			
135		Tuolomne River	Quality	TBD			
136		Merced River	Quality	TBD			
137		San Joaquin River	Quality	TBD			
138		Tuolumne River	Quality	TBD			
140		S. Joaq. Rr at Vernalis	Quality	TBD	P50 P		
141		Merced River	Quality	TBD			
142		S. Joaquin River	Quality	TBD			
143		Tuolomne River	Quality	TBD			
144		All affected lands	Quantity	8.2 TAF/yr	SB 23, P50	1,360 AF/yr	
145		All suitable lands	Quantity	TBD			
146		Wetlands	Quantity	<1 TAF/yr			
156		San Joaq. Rr	Quality	TBD			

Quantifiable Objective
CALFED Ag WUE

Table 1. Summary of all Targeted Benefits (QO) and progress to date.

Sub-Region	TB#	Location	Category	QO	Address	Expected Benefit	Progress
					Funding Source P = project; F = feasibility, study or research		
13. Eastern Valley Floor between San Joaquin River and Merced River	147	Merced River	Flow	1.9 TAF/yr			
	148	San Joaquin River	Flow	TBD			
	149	Merced River	Quality	TBD			
	150	San Joaquin River	Quality	TBD			
	151	Merced River	Quality	TBD			
	152	San Joaquin River	Quality	TBD			
	154	S. Joaq. Rr at Vernalis	Quality	TBD			
	155	Merced River	Quality	TBD			
	157	All affected lands	Quantity	17.4 TAF/yr			
	158	All suitable lands	Quantity	TBD			
	159	Merced National Wildlife Refuge	Quantity	TBD			
160	Wetlands	Quantity	3.8 TAF/yr				
161	Salt affected soils	Quantity	TBD				
14. Westland Area	94	Panoche Creek	Quality	TBD			
	105	Panoche Creek	Quality	TBD			
	162	Five Mile Slough	Quality	TBD			
	163	All affected lands	Quantity	TBD			
	164	All affected lands	Quantity	8.9 TAF/yr	SB 23 F, P13		
	165	All suitable lands	Quantity	TBD			
	166	Salt affected soils	Quantity	TBD			
15. Mid-Valley Area	167	All affected lands	Quantity	<1 TAF/yr	P50 P	618 AF/Y	
	168	All affected lands	Quantity	6.1 TAF/yr	P50 P		
	169	All suitable lands	Quantity	TBD			
	170	Salt affected soils	Quantity	TBD			
16. Fresno Area	171	San Joaquin River	Flow	TBD	SB 23		
	172	San Joaquin River	Quality	TBD			
	173	San Joaquin River	Quality	TBD			
	176	All affected lands	Quantity	7.3 TAF/yr	SB 23		
	177	All suitable lands	Quantity	TBD			
17. Kings River Area	179	All affected lands	Quantity	TBD			
	180	All affected lands	Quantity	14.2 TAF/yr			
	181	All suitable lands	Quantity	TBD			
	182	Salt affected soils	Quantity	TBD			
18. Kaweah River and Tule River Area	183	All affected lands	Quantity	<1 TAF/yr			
	184	All affected lands	Quantity	13.2 TAF/yr			
	185	All suitable lands	Quantity	TBD			
	186	Pixley National Wildlife Refuge	Quantity	TBD			
	187	Salt affected soils	Quantity	TBD			
19. Western Kern County	188	All affected lands	Quantity	<1 TAF/yr	SB23 P, P50 P	500 AF/YR	280 AF/YR
	189	All affected lands	Quantity	4.5 TAF/yr			
	190	All suitable lands	Quantity	TBD	P50		
	191	Kern National Wildlife Refuge	Quantity	TBD			
	192	Salt affected soils	Quantity	TBD			
20. Eastern Kern County	193	All affected lands	Quantity	8.1 TAF/yr	SB 23		
	194	All suitable lands	Quantity	TBD	SB 23		
	195	Salt affected soils	Quantity	TBD			
21. Kern River Area	196	All affected lands	Quantity	<1 TAF/yr	SB 23		
	197	All affected lands	Quantity	6.4 TAF/yr	SB 23		
	198	All suitable lands	Quantity	TBD	SB 23		
	199	Salt affected soils	Quantity	TBD			