September 30, 2005
Work Plan for Fiscal Year 2006

I. Ecological/Water Systems Operations Models, CVPIA Section 3406(g)

II. Responsible Entities

	Agency	Name	Role
Lead	USBR	Lloyd E. Peterson	Program Manager
Co-Lead	USFWS	Andrew Hamilton	Program Manager

III. Program Objective for FY 2006

The objective is to develop readily usable and broadly available models and supporting data to evaluate the ecologic and hydrologic effects of existing and alternative management strategies of public and private water facilities and systems in the Sacramento, San Joaquin, and Trinity watersheds. Specific to FY are:

A. Calsim II and Calsim III Development
B. CALSIM Review and Documentation
C. CALSIM Training of agency and private sector staff.
D. River and Reservoir Temperature Model Development
E. Membership and Participation in Professional Organizations

IV. Status of the Program

The Ecological/Water Systems Operations Models, CVPIA Section 3406(g) program is a continuing program that started in 1994.

The program has supported the Ecosystem Modeling Consensus Project, review and update of the Central Valley Ground-Surface water model (CVGSM); development of a graphical user interface (GUI) and database for PROSIM and SANJASM (note: This GUI effort was abandoned because CALSIM replaced PROSIM and SANJASM, as well as DWRSIM); development of the 3-D temperature model for Whiskeytown Reservoir, development of CALSIM II, and hydrologic input for CALSIM.

Since 1998 this program has supported a steadily increasing level of support for CALSIM II development and application. The California Department of Water Resources and Reclamation have made a large investment in CALSIM and it is essential for Interior to participate in and guide its development and application. CALSIM II is now available for public use and is used in most, if not all, current water supply improvement studies.

This program supports new development of reservoir and river temperature models used by the Division of Planning and private contractors for modeling support for operations and planning.

This program supports training conducted by Reclamation and the California Department of Water Resources. The Mid-Pacific Region Division of Planning, the U.S. Fish and Wildlife Service, the California Department of Water Resources, and private contractors all have staff capable of applying these models trained under funding from this program.

This program provides a platform for staff to solicit and manage funds from other sources.

The primary benefit of this funding has been the development of Calsim into the reservoir system model of choice for investigations of managing and modifying the Central Valley Project and the State Water Project. Calsim was the model applied to develop the most recent Central Valley Project Operations Criteria and Plan (CVPOCP).

V. FY 2005 Accomplishments

A. The staff of the River Systems Analysis Branch (MP-710), Reclamation's Technical Service Center, Derek Hilts (USFWS), and private contractors developed code and data, reviewed CALSIM II, and participated in CALSIM III development.

B. Support of a comprehensive review of the CALSIM II simulation of electro-conductivity at Vernalis on the San Joaquin; and improved simulation of the east side reservoir operations and irrigations demand. This review has received an additional $80,000 of support from the California Water and Environmental Modeling Forum, Calfed Science and water districts. This activity is unprecedented in that Reclamation simultaneously publicly introduced these model enhancements and initiated an outside review in a meeting in Modesto (August 2005).

VI. Tasks, Costs, Schedules, and Deliverables

Narrative Explanation of Tasks (note these are in order of priority)

3406(g) Narrative Explanation of FY 06 Tasks		
Program Objective ID*	**Task #**	**Narrative Explanation of Task (Lead Agency in Parenthesis)**
A-F	1	Program management – Managing this program and administration of contracts (USBR)
C	2	Continuing review and documentation of CALSIM II code. (USBR)
A	3	Continuing Reclamation development of CALSIM. Eighteen month plan for development of Calsim III was initiated at the end of FY 04 and will continue through FY 06. (USBR)
A	4	US Fish and Wildlife Service staff oversight of modeling activities USFWS)
C	5	Development and documentation of application of Calsim to Central Valley. This task refers to the quality control and review of input (such as agricultural demands). (USBR)
D,F	6	Membership and Participation in Professional Organizations including membership in the California Water and Environmental Modeling Forum and conferences with organizations such as American Society of Civil Engineers and American Water Resources Association. This is includes participation in CWEMF sponsored Calsim training. (USBR)
Additional Program Needs		
E		Sacramento River chinook model Calibration and analysis. Calibration and analysis will include testing of existing model output and individual examination of two life stage modules, calibrating them against available data and then using the calibrated modules for pilot analyses of important management issues. (USFWS)
Key to Objective ID		

- **A**. CALSIM II Development
- **B**. Process Based CALSIM Module Development
- **C**. CALSIM Review and Documentation,
- **D**. CALSIM Training
- **E**. Fishery Model Development
- **F**. Membership and Participation in Professional Organizations

B. 3406(g) Schedule and Deliverables

#	Task	Start	End	Deliverable
1	Program Management	10/1/04	9/30/05	Annual work plans; awarding and management of grants; supervision of staff on 3406(g) funded projects
2	CALSIM Review/Documentation	10/1/04	9/30/05	Refined and commented WRESL code in CALSIM
3	CALSIM Development (USBR)	10/1/04	9/30/05	Coding to improve elements of model such as EWA, (b)(2), and allocation simulation
4	USFWS CALSIM Oversight	10/1/04	9/30/05	Reviews of CALSIM, participation in development meetings
5	Hydrology Documentation	10/1/04	9/30/05	Manual
6	Participation in Prof. Organizations	10/1/04	9/30/05	Shared technology

C. Summary of Program Costs and Funding Sources.

#	Task	Total Cost	W&RR	DWR	CALFED	Other Reclamation Funds
1	Program Management	$182,000	$82,000	100,000		
2	CALSIM Review/Documentation	$100,000	$50,000	$50,000		
3	CALSIM Development	$750,000	$250,000	$500,000		
4	USFWS CALSIM Oversight	$52,000	$52,000			
6	Hydrology Documentation	$188,000	$88,000	$100,000		
7	Participation in Prof. Organizations	$56,000	$28,000	28,000		

D. CVPIA Program Budget.

#	Task	FTE	Direct Salary and Benefits Cost	Contract Costs	Misc. Costs	Admin Costs	Total
1	Program Management	0.50	$41,000			$41,000	**$82,000**
2	CALSIM Review/Documentation	0.31	$46,000			$4,000	**$50,000**
3	CALSIM Development (USBR)	1.5	$225,000			$25,000	**$250,000**
4	USFWS CALSIM Oversight	0.27	$40,000	$2,000		$10,000	**$52,000**
6	Calsm application documentation	0.30	$50,000	$28,000		$10,000	**$88,000**
7	Participation in Prof. Organizations	0.17	$25,000		$3000		**$28,000**
	USBR		**$387,000**	**$26,000**	**$3000**	**$80,000**	**$498,000**
	USFWS		**$40,000**	**$2,000**		**$10,000**	**$52,000**
	Total by Category		**$427,000**	**$30,000**	**$3,000**	**$90,000**	**$550,000**

Table E
CVPIA 3406(g) Five Year Budget Plan
FY 2006-FY2010
($ Thousands)

	2006	2007	2008	2009	2010	Total
W&RR	550	550	560	572	583	2815

VII. Future Years Commitments/Actions

Certain CALSIM applications will require a smaller time step than a month. DWR has initiated development at a smaller time step (especially useful for the delta part of the model and assessment of flood operation). Reclamation will participate as time and funding permit. Ground water algorithms within Calsim must be improved to more reasonably simulate aquifer to surface water interaction. Agricultural demand simulation must be refined to respond closer to the way water contractors actually do in terms of fallowing and changing crops. Current CALSIM II treats deliveries on the Friant-Kern canal as a time series (based on historical demand). Future development will explicitly include the Friant service area.