PRELIMINARY REVIEW OF SWRCB PROPOSAL TO REOPERATE NEW DON PEDRO RESERVOIR

PROPOSED SWRCB CONJUNCTIVE USE PLAN

August - October	* Increase Don Pedro Reservoir storage by storing excess historical releases, within flood control constraints, but only meet minimum fish release requirements.
November - January	* Divert excess historical releases to ground water spreading basins or farmland.
February - March	* Same as August - October.
April - July	* Release historical releases, plus water stored during previous August - March period (if any) plus 80% of the amount of water diverted to the ground water spreading basis or to farmland during the November - January period.

Conjunctive Use Amounts in Acre-Feet x 1,000
(1976 - 1986 Period)

Water Year	(N)	Modesto (32%)	Turlock (68%)	MID + TID (100%)	Merced	Total
Critical	(2)	0.4	0.7	1.1	-0-	1.0
Dry	(3)	10.2	21.6	31.8	1.3	33.1
Below Nor.	(1)	56.8	120.8	177.6	100.7	278.3
Above Nor.	(2)	73.7	156.6	230.3	158.2	388.5
Wet	(6)	100.5	213.5	313.9	163.2	477.1

Evaluation for MID and TID will be for wet year situation.
Assume 315,000 AF to be recharged.

TUOLUMNE RIVER FLOW: APRIL - JULY
(acre-feet)

Year	Type	Actual Flow Below La Grange Dam	Increase Flow From Don Pedro Reoperation and Conjunctive Use	Total Expected Flow
1972	D	7,738	-----	-----
1973	AN	17,390	74,120	91,510
1974	W	19,850	178,891	198,741
1975	W	40,700	407,552	448,252
1976	C	8,439	199,130	207,569
1977	C	4,191	17,712	21,903
1978	W	254,580	-44,166	210,414
1979	AN	61,020	204,696	265,716
1980	W	384,670	350,280	734,950
1981	D	21,690	208,766	230,456
1982	W	991,100	4,400	995,500
1983	W	1,669,900	349,675	2,019,575
1984	BN	50,300	777,552	827,852
1985	D	16,564	206,718	223,282
1986		541,310	2,096	543,406

SWRCB STAFF ASSUMPTIONS:

* Average water table depth = 100 feet

* At least 1,000,000 AF could be recharged on 30,000 acres of crop land in three months, i.e., 10 AF/A

* Reservoir storage reduced to flood control level as quickly as possible

Farmland Flooding Option

Assume areas appropriate for any winter season recharge would be east of high water table area (Highway 99) and west of area with hardpan soils.

MID ~ 21,000 acres

TID ~ 42,000 acres

Recharge 315,000 acre-feet on 63,000 acres = 5.0 AF/A.

Recharge must take place during three winter months.

Assumed average depth to water table is 50 ft.

Assumed water storage coefficient is 0.10, therefore, 5.0 AF/A can be stored in 50 ft. of soil by bringing the water table to the ground surface.

SWRCB assumes an infiltration rate of 0.3 ft/day.

We believe the infiltration rate to be ~0.1 ft/day.

At 0.3 ft/day = 17 days of flooding necessary.

At 0.1 ft/day = 50 days of flooding necessary.

There would be minimum lateral movement of water from recharge area during three month flooding period, however, long term ground water storage would not be stable.

If the SWRCB Plan proposed Farm Land Flooding acreage of only 30,000 acres is used then 10.5 AF/A would have to be stored on the area. There is insufficient ground water storage capacity in any 30,000 acre area of TID-MID land.

The flooding periods for 0.1 and 0.3 ft/day would be 35 and 100 days, respectively.

District Problems

* Maintenance period reduced.

* Additional equipment and personnel would be required.

* Insufficient time available to make major improvements in drop structures, control structures and other major facilities.

* Would need additional turnouts to distribute water.

* Would need additional wells to recover water.

* Would need additional electrical facilities.

* If 20,000 acres of land is taken out of production and used for a recharge basin there would be no need for irrigation water for that area.

* Price of power to be purchased under current power contracts is expected to change at the end of 1992 (TID). It is expected that there will be a different price for summer and winter energy.

* TID would lose value of power generated at La Grange during November, December and January.

* Staying on flood control curve would cause a loss capacity due to a loss in flexibility in operation.

Farmer Problems

No time for winter work

- Pruning
- Spraying
- Weed control
- Cover crop

Loss of herbicides and fertilizers

Additional fungus problems

Soil puddling will increase

Wind damage to trees and vines in wet soil

Inability to grow a winter crop

No time to maintain farmer distribution system

ADDITIONAL COSTS MID

Additional Gunite Machine and equipment - $200,000

Canal Cleaning would need to be carried out in two or three months instead of five months - extra cost?

		Annual Cost
Gunite $\frac{\$200,000}{10 \text{ years}}$ =	$20,000	
Labor	$60,000	
Materials	4,000	
Canal Cleaning Labor	20,000	
Subtotal:		$ 104,000

Ground Water Recovery - 100,000 AF

10.0 AF/day/well

$\frac{100,000AF}{120 \text{ days}}$ = ~ 83 wells

83 wells x $50,000 ea.= $4,150,000

$\frac{\$4,150,000}{10 \text{ years}}$ =	$415,000	
Energy cost = $ 3.00/AF =	$300,000	
O & M cost = $ 1.00/AF =	$100,000	
Subtotal:		$ 715,000

Electrical System

Assume 83 - 100 HP wells = 6,640 kw

6.64 MVA x $178,000/MVA ÷ 30 =	$39,400	
Line Extension 83 x $9,025/well÷30=	25,000	
O & M Cost (10% Cap. Cost)	193,000	
Subtotal:		$ 257,400

Water Distribution

Turnouts (0)	---	---
Pipe (0)	---	---
Canal tenders (3)	$ 30,000	
Irrigators (8)	$140,000	
Payment to farmers		
Subtotal:		$ 170,000
Total Annual Cost		$ 1,246,400

ADDITIONAL COSTS TID

Additional Gunite Machine and equipment - $200,000

Canal Cleaning would need to be carried out in two or three months instead of five months - extra cost.

			Annual Cost
Gunite	$200,000 / 10 years =	$ 20,000	
Labor		120,000	
Materials		4,000	
Canal Cleaning Labor		40,000	
Subtotal			$ 184,000

Ground Water Recovery - 215,000 AF

10.0 AF/day/well

215,000AF / 120 days = ~ 180 wells

180 wells x $50,000 ea.= $9,000,000

$9,000,000 / 10 years =	$ 900,000	
Energy cost = $3.00/AF =	$ 645,000	
O & M cost = $1.00/AF =	$ 215,000	
Subtotal:		$ 1,760,000

Electrical System

Assume 180 - 100HP wells = 14,600 kw		
14.6 MVA x $200,000/MVA ÷ 30 yr.	$ 97,300	
Line Extension	36,000	
O & M (10% Cap Cost)	315,200	
Subtotal:		$ 448,500

Water Distribution

Turnouts (100)	$ 350,000	$ 35,000	
Pipe (1000 turnout)	$2,800,000	$ 280,000	
Canal tenders (5)		$ 50,000	
Irrigators (25)		$ 430,000	
Payments to farmers			
Subtotal:			$ 795,000
Total Annual Cost			$3,187,500

Spreading Basin Option (MID-TID Evaluation)

Assume 20,000 acres would be purchased for recharge basin per SWRCB Draft Salinity Control Plan.

Land cost would be between $5,000 and $8,000 per acre.

Assuming Modesto 22%

Turlock 48%

Merced 30%

Then the cost for land for each District would be approximately -

Modesto - $20 to $32 million

Turlock $50 to $80 million

Merced $30 to $48 million

Add $1,000 per acre for basin construction and control facilities or -

Modesto - $ 4 million

Turlock - $10 million

Merced - $ 6 million

Annual O & M Cost would probably = $100 per acre or -

Modesto - $ 400,000

Turlock - $1,000,000

The Districts would still have the same problems listed in the Farmland Flooding Option in a portion of the distribution system, depending on the location of the Spreading Basins.

Recharge Needs

315,000 acre-feet on 20,000 ac

requires spreading 15.7 AF/A

At 0.3 ft/day = 52.5 days of flooding

At 0.1 ft/day = 157.5 days of flooding

With only 5 ft. of storage capacity available in suitable spreading areas, it will be impossible to recharge the 15.75 AF/A on 20,000 acres.

Must use at least 63,000 Acres

Miscellaneous Problems

Routing storm water

Additional rural area runoff

Canal tenders access to canal system during winter

Measuring water delivered to farmers

Liability for additional drainage problems

Liability for road maintenance problems

Minimum evapotranspiration during winter