A Sample Hybrid Export Regime
Designed to Allow Easy Modification
November 30, 1998
Draft

Default Operational Rules

Accord - E/I + VAMP extended to 45 days + additional 15 discretionary days + all AFRP.

These default conditions reflect elimination of an element of the Accord which is believed to be inefficient at addressing the intended problem, and the addition of a prescriptive action that is likely to address the most prominent aspect of the intended problem.

The E/I ratio effectively dedicates a volume of water to the reduction of entrainment effects. The way the E/I ratio interacts with the projects results in a volume of water (and, more importantly, a number of fish) that is unavailable for export. This volume of water is greater in years when springtime inflows decline and the percentage of inflow captured for export increases. It may be possible to protect a greater number of fish by re-implementing this standard into a similar volume of water that is used to reduce export impacts in a manner more focused on known distributions and abundances of fish. These default operations assume such an implementation strategy; they do not imply a lack of concern about entrainment effects.

The Vernalis Adaptive Management Plan (VAMP) is a re-implementation of the Vernalis flow requirements in the 1995 SWRCB Plan. A number of entrainment concerns have arisen in recent years about the weeks surrounding the 31 day VAMP period. Extension of the VAMP conditions of exports and flows (to the extent possible) directly addresses these entrainment concerns. The VAMP conditions reflect the same reservoir and hydrological conditions that would need to be addressed with any effort to protect the species of concern in a balanced fashion. Use of the VAMP conditions could permit more experimental releases of salmon and, hence, more data to evaluate the relative effects of flow and export on salmon passage. The extension of VAMP by 15 days reflects a likely need to a greater percentage of the outmigrating salmon population if they are listed as an endangered species. The appearance of young delta smelt at the export facilities has been a regular occurrence at some point in the April-June period, and the discretionary 15 days are intended to address those years when delta smelt entrainment is a problem at a time outside of the expanded VAMP window.

Implementation of the full AFRP is required under federal policy, but a commitment was expressed to use JPOD and other water supply tools to try to reduce impacts on federal contractors. Many of the AFRP actions directly address potential problems identified by DEFT.

Possible Modifications:

o *Change number of VAMP days and/or change number of discretionary days at this*

season. Such changes would affect the need to find other sources for the EWA to address pumping effects at other times.

- *Modify, rather than eliminate, E/I Ratio as an operational control. This would reduce volume of water immediately available to EWA, but increase somewhat the level of entrainment effects throughout the period.*
- *Tighten default rules. Reduce access to environmental credits.*
- *Move AFRP in-delta actions to list of priority actions for implementation through EWA, rather than as part of default operational criteria. Increase volume of EWA water available but broaden list of environmental needs.*

Snapshot of possible arrangements on day 1 -- Assumed to be August 21, 1999 (San Luis low point)

1. EWA controls 100 kaf of non spillable water stored south of the delta. This water would need to be deposited during 1999. There is currently an abundance of water throughout the system but a shortage of storage sites. A storage site could be arranged as part of the Stage 1 implementation package through negotiations of agreements, leases, or purchases. The EWA must be able to drain and refill this storage at least until greater amounts of storage become available elsewhere.

2. E/I ratio is eliminated,[1] VAMP period is extended to 45 days +15 days, Joint Point of Diversion (JPOD) is implemented (as discussed above)[2]. EWA and the water users share the net benefits of these changes to the system in some fashion. For example, the net supplies might be shared equally. Sharable yield, compared to an Accord + all AFRP baseline is probably in the range of **[fill in, based upon new DWRSIM run]**. The environmental water is delivered via contracts with the State and Federal Projects, in a manner similar to water deliveries for other contract holders. The amount of water to be delivered each year would be based upon a negotiated methodology. Deliveries to the EWA would vary with annual hydrology, reservoir storage, etc., and should track closely the actual amounts of new supplies generated by the changes made to E/I, VAMP and JPOD during various kinds of water years. This contracted water would not rely upon access to storage, if used in the same year, but come from the improved State and federal project supplies. Point of delivery might nominally be San Luis Reservoir with a date of

---

[1] Contract with USBR and SWP for 100% share of supplies generated by elimination of E/I. Language in the 1995 WQCP permits flexing of E/I ratios to improve protection of fisheries as long as change in total exports is zero within six months. A change in this language to increase the averaging period would add considerable flexibility.

[2] Negotiations are underway to allow a joint point of diversion with different constraints than at present, which greatly restricts any use of JPOD to increase delta exports. Language about use of JPOD could return water released from federal reservoirs to meet the upstream AFRP actions to federal contractors south of the delta. Such use of JPOD could greatly reduce the impact of in-delta AFRP actions.

delivery of August 30. Point and date of delivery could be transferred as with other export contracts. If EWA contract amounts are not transferred to another party, then storage would be needed to accumulate water for use in future years.

3. EWA controls 200 kaf worth of option contracts for water south of the Delta, with enough money in reserve to call in those options for 4 years during Stage 1 of CALFED implementation.

4. Additional EWA water may be generated by curtailing the VAMP period or by not using all 15 discretionary days of shut down (see description of default rules).

Possible Modifications:

- *The sharing of system benefits from elimination of E/I, extended VAMP, and JPOD can be dealt with in numerous ways. The overall net water supply benefits might be shared as is implied in the text above. Alternatively, each piece might be dealt with separately (e.g., EWA gets x% of the yield from elimination of E/I, y% of the benefits of JPOD, and pays for z% of the costs of the extended VAMP, where x,y, and z could each vary from 0 to 100). Such an approach would require additional model runs to calculate the impacts of each measure separately. It may be easier, at least initially, to worry about the aggregate effects of these measures instead to breaking them out at this point.*
- *Instead of contracts for a share of new net supplies from elimination of E/I and JPOD + expanded VAMP, water in the EWA could be accounted within a strict daily accounting as discussed at the November 24 meeting.*
- *Contracts could be based on dry period or average improvements to supply, they could be based on a minimum amount to be delivered in all years, or an amount that varies with other contract deliveries, or a combination of the above where dry period deliveries are used to define a minimum and average improvements are used for actions that do not relate to present standards.*
- *More or less water could be developed through options.*
- *More or less water could stored during 1999 in advance of the start date.*
- *It may be possible to expand Banks pumping levels to around 8,500 cfs by day 1. If so, then more up front benefits would be possible.*

Further development of EWA during Stage 1

1. EWA controls 50% of new storage south of the Delta during Stage 1. Assume 300 kaf of environmental high priority storage by the end of Stage 1. This implies that total new south of Delta storage capacity must be at least 600 kaf by the end of Stage 1. The EWA storage is fillable using any water available to EWA.

2. EWA contract with USBR and SWP for 50% share of supplies generated by (1) expansion of Banks pumping and (2) State/Federal canal intertie. The contract might be handled in the same way as the initial contracts, discussed above.

3. EWA cofunds reclamation project in southern California and gains credits for its share of water produced each year. Assume 20 kaf of reliable water each year.

4. Expansion of option contracts by 200 kaf.

Possible modifications:

- *Same comments as under "day 1" modifications section on approaches to accounting and sharing.*
- *More or less reclamation. More or less option contracts. More or less storage.*

Benefits

Assuming that the EWA and the water users each receive a 50% share in the net benefits of the actions taken to expand system flexibility and capability, the following changes in access to water supply might be anticipated, relative to a baseline of Accord + all AFRP.

Day 1

EWA

[ ]	Average year deliveries from Projects
[ ]	Dry period deliveries from Projects
100 kaf	Wet water in high priority, refillable storage
Extended VAMP	Variances allowable to generate EWA water
200 kaf	Option contracts south of the Delta.

Water Users

	[ ]	Average year deliveries from Projects
	[ ]	Dry period deliveries from Projects
or	[ ]	Average year deliveries from Project, using Accord baseline
	[ ]	Dry period deliveries from Projects, using Accord baseline

End of Stage 1

EWA

[ ]	Average year deliveries from Projects
[ ]	Dry period deliveries from Projects
300 kaf	Control over high priority, refillable storage
Extended VAMP	Variances allowable to generate EWA water
400 kaf	Option contracts south of the Delta.

Water Users

	[ ]	Average year deliveries from Projects
	[ ]	Dry period deliveries from Projects
or	[ ]	Average year deliveries from Project, using Accord baseline
	[ ]	Dry period deliveries from Projects, using Accord baseline
	300 kaf	Control over high priority, refillable storage

Possible modifications:

- *Modifications in the sharing formulas, or the measures taken before "day 1" and before the end of Stage 1 will change these values.*

<u>Relationship to upstream water</u>

1. There will be upstream environmental accounts. Changes in Delta operations may have upstream storage and yield implications. All operations will be based upon the "no harm" principle. If EWA operations in the Delta cost water upstream (something that may not be known until the next winter), the EWA is responsible for finding compensation water. Similarly, if EWA operations in the Delta increase net supplies, the EWA will control this water.
2. The EWA, ERP, and CVPIA water purchase program will be integrated. Upstream EWA water may be used to satisfy instream flow targets and may be exported (at the discretion of the eco managers) to generate water in export areas. ERP and CVPIA purchases may be used to pay off upstream and export EWA debts to the water users.

   The key point is that all environmental water acquisition and operations should be integrated to generate maximum benefits. Whether or not there should be one account or two for accounting purposes is another issue. Unless water users are willing to allow EWA water in Shasta to be converted directly into export reductions, there will need to be multiple water accounts. Probably the bare minimum needed will be one account for export areas, another for the San Joaquin tributaries, and another for the Sacramento and

tributaries. The key criterion is that EWA operations should not cause harm to water users. Accounts will be defined as needed to provide this assurance.

Fungibility of EWA Credits

Except for the linkage between the EWA and the ERP water purchase program, water and money dedicated for the EWA cannot be reallocated to other ERP programs without the consent of all agencies with ESA responsibilities -- USFWS, NMFS, DFG. However, EWA water may be sold in order to help fund other EWA assets, such as storage facilities or water option contracts.

Possible modifications:

- *EWA/ ERP/ CVPIA water acquisition assets could be made more fungible. For example, habitat might come to be seen as more important than water. If so, then locking away environmental assets in water could be suboptimal. On the other hand, it is unlikely that major shifts in priorities will appear over the next 7 years and locking in environmental water assets may by an important factor in regulatory agency willingness to grant regulatory stability. The above proposal seems a reasonable comprimise.*

Operating/ Accounting Procedures

1. The fundamental principle is "no harm". This cuts both ways. The EWA is responsible for supplying makeup water to the projects or for compensating those impacted by EWA operations. EWA operations that do not harm the water users do not require compensation (e.g., if San Luis fills despite EWA operations, then no compensation is required.). The EWA will be required to pay for any incremental power costs resulting from its operations.
2. The EWA would operate on a fiscal year that runs from one low point in San Luis to another. Nominal delivery of EWA water to San Luis on Aug 30 of each year would permit clearer accounting and payback.
3. EWA may call for export reductions based upon the expected delivery of water to its account within its "fiscal" year. Deliverable quantities include:

    1. Expected contract allocations from the state and federal projects; plus
    2. EWA water in surface storage; plus
    3. EWA groundwater storage that can be extracted in time to compensate water users within the EWA fiscal year; plus
    4. Water generated by efficiency or reclamation projects within the "fiscal" year; plus
    5. The amount of callable water option contracts within the current year; <u>minus</u>
    6. The amount of credits already expended in the current year.

4. If EWA calls for export reductions between the end of the "fiscal" year and the high point

in San Luis, then the amount of export reductions that must be made up is the lesser of (1) the unfilled portion of San Luis and (2) the amount of export reductions required. Thus, if San Luis fills, EWA debts to the projects are erased.

5. The EWA may make arrangements to carry over debt across "fiscal" years, using voluntary arrangements. For example, if San Luis has significant carryover storage and no users will be harmed by a delayed payback, then the debt may be carried into the next winter. If San Luis fills, then the debt will be erased. Similarly, the EWA may use its assets as collateral for multiyear loans (e.g., it may use groundwater storage as collateral for a long term loan of water from MWD).

Environmental priorities for state and federal conveyance and storage facilities

Priorities for conveyance, in descending order:

1. Firm contract deliveries -- including contract deliveries for the EWA.
2. EWA water generated by increased operational flexibility.
3. Non firm deliveries to contractors
4. Reserved space for market transfers, including EWA transfers
5. EWA operations -- e.g., shifting water from one storage site to another.

Priorities for project storage are unclear. In this scenario, the EWA has access to 100 kaf of high priority, refillable storage initially, increasing to 300 kaf by the end of Stage 1. However, that storage does not necessarily need to come from the state and federal projects. In general, unless the EWA is granted higher priority within the projects through negotiation, EWA water stored within the state and federal storage facilities will be the first to spill.

Possible modifications:

- *Development of priorities for access to existing facilities will be very complex. Water users may feel that non-firm water deliveries are part of the existing system. Therefore, placing these deliveries below EWA water will cause them harm. On the other hand, regulatory agencies may see EWA operations as a substitute for standards, which would imply that which would have an even higher priority than contract deliveries. Negotiation of a priority system is effectively the same as negotiating a new COA and will take time to put into final form. In the short term, less formal arrangements might be possible.*

Biological Aiming Points

Two efforts have been made to estimate the biological needs to protect fishes of the estuary from the effects of entrainment or to provide sufficient ecosystem level improvements to compensate for export impacts. These efforts are represented by the 'prescriptive' scenario A developed by USFWS and NMFS and the 'mortality reduction' scenario E developed by other parties in DEFT. When the incremental costs of in-delta AFRP actions are considered, both of these scenarios give

impacts on delta exports in the range of 300 kaf. Supply benefits of implementing E/I as an EWA are approximately 180 kaf. Releasing the Corps' 4-Pumps Criteria, unlimited JPOD and a state/federal intertie generates an improvement supply of about 238 kaf, on average. Not all desirable modeling runs have ben done but the costs of proposed protective measures seem to be roughly similar and less than the average volume of water that might be available to the EWA in stage one. Appendix A is a rough approximation of how an EWA might have operated in a relpay of the years 1987-1994. Seven of these eight years were critically dry, but water could be generated in all but three of them to meet the positive QWEST criterion in January, without taking any extra exports in May or June (when the proposed expansion of VAMP conditions would prohibit such actions). This simulation should be repeated with a run wherein the two month VAMP is included as a starting condition, but those results were unavailable. From this simulated drought, a total of 500 kaf is suggested as a necessary volume of options or alternative supplies.

Decisionmaking authority

Near term authority for decisionmaking of EWA resides in USFWS, NMFS, DFG. Operational decisions generally worked out in Ops Group. Where time is essential, a subgroup may make decisions.

Day 1 assets (non spill storage, options) secured by SWP and USBR in consultation with USFWS, NMFS, DFG.

Longer term institutional arrangements still to be negotiated.

Possible modifications:

- *Many stakeholders have expressed the concern that even near-term control over the EWA by the regulatory agencies is problematic, since it might undermine a high priority stakeholder proposal -- the establishment of a single authority for implementation of the entire CALFED ecosystem program. It might be possible to implement the EWA through a single eco entity, provided that ultimate responsibility and authority for protecting endangered species remains with the regulatory agencies.*

Regulatory Certainty

[Outside the purview of the DNCT]

Who Pays

[Outside the purview of the DNCT]

APPENDIX: A DROUGHT EXAMPLE OPERATION
EWA = SUM OF ADDED EXPORTS UNLESS SLR IS FILLED
NO ADDED EXPORTS IN APRIL AND MAY,
JAN QWEST HELD TO 0, ANY ADDED EXPORTS IN JAN REDUCE QWEST

	ADDEDSLR EXPORT FILLED? S	QWEST	EWA
1987	33	-382	33
NOV	5	-239	38
DEC	58 YES	-353	0
JAN	-35 YES	-27	0
FEB	3 YES	23	0
MAR	3 YES	29	0
APR	261	-182	0
MAY	29	-2	0
JUNE	439	-392	439
JULY	94	-155	533
AUG	-291	-96	242
SEP	-194	0	48
1988	4	-190	52
NOV	0	-52	52
DEC	130	-527	182
JAN	195	-451	-256
FEB	-61	11	-317
MAR	12	-46	-305
APR	180	-134	-305
MAY	27	-22	-305
JUNE	-92	-4	-397
JULY	-155	-3	-552
AUG	-37	101	-589
SEP	1	0	-588
1989	-68	-24	-656
NOV	0	-169	-656
DEC	0	-201	-656
JAN	34	-396	-362
FEB	0	82	-362
MAR	203	-321	-159
APR	139	-152	-159
MAY	47	-30	-159
JUNE	553	-469	394
JULY	65	-148	459
AUG	-271	-10	188
SEP	41	-206	229
1990	-30	-351	199
NOV	-7	-266	192

DEC	10		-284	202
JAN	167		-537	-370
FEB	-100	YES	-55	0
MAR	49	YES	-176	0
APR	146		-133	0
MAY	26		13	0
JUNE	-157		14	-157
JULY	-251		44	-408
AUG	0		100	-408
SEP	-73		-30	-481
1991	3		-129	-478
NOV	-16		-96	-494
DEC	-41		-102	-535
JAN	-40		-39	-79
FEB	2		112	-77
MAR	193		-352	116
APR	105		-81	116
MAY	29		-10	116
JUNE	-107		151	9
JULY	-55		93	-46
AUG	17		30	-29
SEP	-4		-7	-33
1992	44		-53	11
NOV	45		-120	56
DEC	37		-136	93
JAN	23		-318	-295
FEB	65	YES	-49	0
MAR	163	YES	-267	0
APR	144		-78	0
MAY	24		-36	0
JUNE	-141		31	-141
JULY	-33		47	-174
AUG	0		70	-174
SEP	0		0	-174
1993	19		-2	-155
NOV	10		-82	-145
DEC	147		-412	2
JAN	109		394	111
FEB	110		121	221
MAR	59		97	280
APR	102		156	280
MAY	89		261	280
JUNE	215		-387	495
JULY	-167		-38	328
AUG	98		-137	426
SEP	40		-251	466

1994	227	-499	693
NOV	123	-435	816
DEC	202	-510	1018
JAN	-160	-23	-183
FEB	-158	108	-341
MAR	-17	-142	-358
APR	257	-212	-358
MAY	26	9	-358
JUNE	439	-394	81
JULY	112	-191	193
AUG	-296	-118	-103
SEP	-54	-127	-157