COMMENTS OF THE ASSOCIATION OF CALIFORNIA WATER AGENCIES ON WATER QUALITY STANDARDS FOR THE BAY-DELTA

Submitted to the State Water Resources Control Board
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ACWA

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The Association of California Water Agencies (ACWA) appreciates the opportunity to submit comments on behalf of its 417 public agency members to the State Water Resources Control Board as part of the fourth workshop on standards for the San Francisco Bay-Delta estuary.[1]

Introduction

Achieving environmental stability in the San Francisco Bay-Delta estuary has never been more urgent. ACWA and its water agency members believe that water quality standards are needed as part of a comprehensive plan to protect Bay-Delta resources and improve reliability of the state's water supply.

The State Water Resources Control Board has the opportunity with these proceedings to end gridlock in Bay-Delta policy and move forward with a plan that complies with the requirements of the Porter-Cologne Act as well as with those of the federal Clean Water Act (CWA), while minimizing the economic impact of the standards.

The Bay-Delta standards proposed by the U.S. Environmental Protection Agency (EPA) fall short of this criteria in several respects. ACWA submitted detailed comments to EPA on its proposal in March. Those comments identified a number of deficiencies in the proposal and in the Regulatory Impact Assessment (RIA) prepared by EPA. A copy of those comments is attached to this submittal today and made a part hereof.

[1] These comments were prepared by ACWA and its consultant, M.Cubed.

In the notice for this workshop, the Board has asked respondents to address one or more of three key issues identified by the Board. ACWA will address all three issues.

Question 1

What fish and wildlife standards should the SWRCB evaluate as alternatives in this review?

Given the flaws in EPA's proposal and the urgent need to address Bay-Delta problems, the water community is developing an alternative proposal that would provide environmental protection as well as water supply certainty.

<u>Water Community Proposal</u>

Urban and agricultural water users are seeking consensus on the proposal, known as the Comprehensive Protection Program for the San Francisco Bay-Delta Ecosystem, and expect to submit additional input on this program to the State Board in the coming weeks.

The goal of the consensus effort is to emerge with a comprehensive plan that includes recommendations for the following:

- Multi-species habitat protection
- Water quality standards
- Operational parameters for water projects
- Measures to address non-water factors affecting the Bay-Delta system
- Potential legislative reforms

The Comprehensive Protection Program outlines a variety of measures falling into three categories. Category I measures include standards for western Delta salinity or Delta outflow in addition to existing requirements under D-1485. The program incorporates a sliding scale and various other features that have broad support.

Category II measures include "conventional" controls on water project operations such as export curtailments, closure of the Delta Cross Channel gate, requirements for pulse flows and reasonable and prudent alternatives for winter-run salmon and Delta smelt.

Measures falling into Category III address important factors outside of the water projects, such as exotic species, toxics, point and non-point sources of pollutants and legal and illegal fishing.

The water community's Comprehensive Protection Program would offer key advantages over EPA's proposal. Most significantly, it would prescribe habitat preservation measures designed to protect a broad range of aquatic species, not just those that are presently listed as endangered, and it would address several factors affecting the Bay-Delta system, not just water project operations. Such an approach is precisely what is needed to stem the downward slide of both Bay-Delta environmental resources and the reliability of the state's water supply.

Water quality standards, Delta outflow requirements and constraints on water project operations by themselves are an incomplete solution. Because they do not address other factors contributing to the decline of fishery resources, they would likely result in water shortages with no guarantee of improvements. Such requirements also result in uncertainty for water users and constrain opportunities for water transfers and water banking, two widely accepted strategies for offsetting shortages.

On behalf of the water community, ACWA is requesting that the State Board schedule an additional workshop as part of these proceedings to allow more work to be completed and submitted on the Comprehensive Protection Program. Once developed, the Board should adopt the program and move ahead with appropriate implementation. For elements of the program that are beyond the Board's direct authority, the Board should endeavor to use its considerable influence to bring about implementation by agencies with the authority to do so.

As it weighs various components of the program, the Board should ensure that the following general points are considered:

- The benefits of any potential measure must be evaluated in relation to its cost in terms of water, reduced operational flexibility, economic implications and other impacts. The Board should also ensure that all measures prescribed offer real benefits in improving the Bay-Delta system.

- The Board should recognize and credit water users for actions already in progress. Acoustical barriers in Georgiana Slough, the temperature control device at Shasta Dam, and operation of the screens at Red Bluff Diversion Dam are examples of efforts already underway that should be considered part of the overall program to fix Bay-Delta problems.

Question 2

How Should the Economic and Social Effects of Alternative Standards be Determined?

Because the state's economy and its environment intersect in the Delta, standards for the Bay-Delta Estuary in combination with other proposed species protection measures cannot avoid having wide-ranging impacts on California's economy. A rigorous evaluation of these impacts is an important task that will lead to better public decision making. The complexity of the economic and environmental systems being considered, however, make this a difficult task, and one that, unless carefully constructed, can result in faulty conclusions . The computer programmer's adage "garbage in garbage out" applies just as well to economic models and forecasts.

ACWA has been advised by staff of the State Water Resources Control Board that the Board intends to adopt the economic models used by EPA in its analysis of economic impacts. This decision means that Board staff must thoroughly evaluate the validity and robustness of the assumptions supporting the economic models, so that the Board may act to correct or improve upon identified weak points in EPA's analysis. Toward this end, the comments herein address themselves to the key issues surrounding EPA's proposed revision of its economic analysis contained in the *Draft Regulatory Impact Assessment of the Proposed Water Quality Standards for the San Francisco Bay/Delta and Critical Habitat Requirements for the Delta Smelt,* dated December 15, 1993.

Extensive review showed this earlier analysis to be deficient in many important respects, particularly in its use of simplifying assumptions with respect to the state's current and future water balance, the ability to perfect transfers, the availability and cost of alternative water resources, as well as a variety of issues specific to the agricultural or urban sectors. While EPA is acting in good faith to revise its analysis to address these issues, the limited time and resources available to complete the revisions make it likely that the impact assessment will remain deficient in important areas.

In addition, there has been no indication that EPA will extend its analysis to include impacts to the state's electricity generation resources. As a result, the analysis will exclude from consideration an important category of impacts that are likely to be equivalent in magnitude to those resulting from reduced surface water deliveries to agricultural or urban sectors.

Therefore, ACWA and the Northern California Power Agencies (NCPA) are undertaking a study that will address the following issues:

- How alternative standards will affect operations of California's hydroelectric system;
- How generation and dispatch of power from other system resources will adjust to accommodate decreased availability of hydropower, and increased groundwater pumping loads;
- Economic and environmental costs associated with these adjustments.

A study description is provided with these comments. Study results will be submitted to the Board and EPA for review, and to allow a more complete evaluation of expected economic costs associated with alternative water quality standards for the Bay-Delta Estuary.

I. Key Issues Affecting both the Agricultural and Urban Sectors

This section addresses several areas of the analysis that are critical to the evaluation of impacts for both the agricultural and urban sectors. These include differentiating between short-run and long-run impacts of the standards; establishing baseline water balances; and the ability and cost of perfecting water transfers.

1) Differentiating between short-run and long-run impacts. To properly assess the costs of the standards, it is necessary to differentiate between short-run and long-run impacts, since they are likely to be very different for at least two reasons. First, there will be a considerable lag between the time new standards are promulgated and the time new supplies — such as from reclamation or long-term conservation — can be brought on line to partially offset reduced Delta exports. For example, a new reclamation facility would typically require five to 10 years to move from planning to permitting to on-line service. A major storage facility may require an additional 10 or

more years. Implementing long-term conservation programs also takes time. While DWR projections show an additional 700,000 acre-feet of supply from long-term conservation by year 2010, only 400,000 acre-feet of this is projected to be in place by year 2000 (DWR Draft Bulletin 160-93). In the short-run, a region's ability to accommodate reduced surface water deliveries would be determined, for the most part, by supply alternatives and management programs already in place.

Second, population growth will result in an increasing demand for water, particularly in the state's coastal urban centers, but also in its fast-growing inland areas. Even accounting for projected long-term conservation, by 2010, municipal demand for water is expected to increase 2.4 million acre-feet from 1990 levels, an average annual growth rate of 1.8% for the period (DWR Draft Bulletin 160-93). Increases in demand will largely offset and may exceed increases in supply that would otherwise be available to augment reduced Delta exports due to the standards. DWR Bulletin 160-93 shows that combined urban, agricultural and environmental demands for water by year 2000 will exceed available supplies by up to 5.5 million acre-feet in average years and by as much as 8.5 million acre-feet in drought years.

Because this changing balance of supply and demand over time is integral to the determination of probable shortage levels due to the standards, it must be accounted for by the impact assessment. Bulletin 160-93, for example, shows the state's demand/supply imbalance increasing from 1990 to 2000, decreasing from 2000 to 2010, and then increasing again from 2010 to 2020 due to the combination of new supply sources and growing demand. A multi-year analysis should be employed to account for these changes, something EPA's initial economic analysis did not do. EPA plans to include short-run, mid-range, and long-run impacts based on supply and demand projections for 1995, 2000, and 2010 in its revised analysis. This will significantly improve upon its earlier, single year analysis. Given DWR projections, it would be advisable to include 2020 as well; while the state's water deficit is expected to decrease between 2000 and 2010, it is expected to then increase from 2010 to 2020. EPA's revised analysis, given its present scope, would not account for this projected additional shortage.

2) Establishing baseline supplies and demands. The expected cost of alternative standards depends on the degree to which shortages to the agricultural and urban sectors might worsen as a result of implementation. The starting point in terms of

supply and demand will play a pivotal role in this determination. Therefore, it is important that the Board fully evaluate the appropriateness of the assumptions regarding baseline conditions employed for the EPA analysis. A proper assessment of the costs associated with alternative standards and implementation strategies will require that both incremental and cumulative impacts of the various regulatory actions affecting Delta operations be taken into account. In this regard, it is important to emphasize that EPA's proposed revision of its draft economic analysis will continue to exclude from consideration Delta actions related to the Central Valley Project Improvement Act (CVPIA). The practical results of this omission are two-fold. First, by excluding the effects of CVPIA from the baseline, the analysis may significantly understate expected costs to the agricultural sector of alternative standards and implementation strategies. Typically, marginal shortage costs increase with the level of shortage as fewer mitigation options become available. Second, cumulative impacts associated with the full range of regulatory actions affecting Delta operations will not be measured.

It is also important that the analysis assess pre-existing shortages by region, for both the agricultural and urban sectors, since these should be expected to differ across regions according to available supply alternatives, transfer capability, and projected demand growth. The following table gives some indication of baseline shortage levels for different regions in the state. The forecasts come from draft Bulletin 160-93 and assume a D-1485 operating environment for the Delta. Shortage forecasts for average and drought conditions are shown for 1990 and 2020.[2] It should be emphasized that the forecasts below do not account for endangered species protection measures affecting Delta operations, and therefore may considerably understate existing baseline shortages.

[2] The 2020 projections assume level 1 water management programs are in place. DWR defines level 1 options as those that have undergone extensive investigation and environmental analyses and are judged to have a higher likelihood of being implemented by 2020.

Bulletin 160-93 Regional Forecasts: Percent Shortage				
	1990		2020	
Planning Region	Average	Drought	Average	Drought
North Coast	0	< 1	0	< 1
San Francisco	0	6.4	0	6.8
Central Coast	0	4.9	2.7	7.0
South Coast	0	11.5	6.3	16.4
Sacramento Riv.	0	7.6	0	6.0
San Joaquin	0	4.3	0	2.8
Tulare Lake	0	6.0	0	6.3
North Lahontan	0	< 1	0	10.4
South Lahontan	0	< 1	5.4	10.9
Colorado Riv.	0	< 1	1.5	1.8

3) Hypothetical transfers must be consistent with transfer capability. Water transfers can be expected to mitigate to some extent shortages due to the standards for both agricultural and urban sectors. However, operational, institutional, and legal constraints will limit the extent of transfer activity. These limitations will be particularly acute in the initial years following promulgation of new standards, but can also reasonably be expected to extend well into the future. In short, the analysis must recognize that a well developed market for water in California does not exist, and may not exist for some time.

Bulletin 160-93 data show that, once contractual obligations, existing Delta operating criteria and endangered species requirements are factored in, the CVP and SWP together have, on average, only about 300,000 acre-feet additional capacity during normal or wet years, and less than one million acre-feet during dry and critically dry years. Much of the capacity available during dry and critically dry years will be needed to accommodate water transfers necessary to offset drought-caused shortages. As a result, capacity available to offset additional shortages caused by the standards could be quite limited. For example, the State Water Bank transferred approximately 600,000 acre-feet of water in 1991 to mitigate drought shortages; about 60% of projected available transfer capacity.

It is also important to recognize that physical limits to transfer capability are more acute in some areas than others. In the agricultural sector, the ability to transfer water from one production region to another is constrained by less than fully integrated conveyance facilities. In the urban sector, the ability to transfer water through the Delta is much more limited for northern regions than for southern ones. For example,

according to draft Bulletin 160-93, Delta conveyance facilities have the capacity to transfer a scant 40,000 to 60,000 acre-feet to Bay Area cities during drought years, and no available capacity during normal years.

Timing constraints also need to be accounted for in an assessment of transfer capability. The ability to engage in transfers will primarily occur during off-peak fall and winter months, a period that does not correspond with peak agricultural or urban demands. Agriculture's ability to perfect transfers to mitigate shortages depends on its ability to store water until the next irrigation cycle. This will differ considerably from region to region and from district to district. Even assuming such storage capacity exists, farmers would be taking a large gamble that the following water year would not be a wet year. If it were a wet year, the value of that water purchased and stored would be considerably less than the price paid. For urban areas also, the ability to mitigate shortages with transfers depends on the extent of available storage when transfer opportunities arise. The narrow pumping windows in which transfers may occur is expected to reduce the number of transfers that would prove feasible.

Take limits to protect endangered species at project pumps remain the largest unknown affecting transfer capacity. Recent history has shown that take limits can substantially reduce the ability to wheel water through the Delta by curtailing pumping during critical pumping periods. Proposed standards would further narrow these opportunities, making it more likely that take limits would significantly impact Delta deliveries. While EPA recognizes take limits to be an important factor affecting the operation of Delta facilities, it has been unable to account for them in its economic analysis. As a proxy, it assumes that take limits would result in no transfers. However, this approach does not consider the effect take limits, in combination with standards, may have on project deliveries themselves. EPA assumes take limits would not affect project deliveries, but recent history suggests otherwise. At this time, independent efforts are being undertaken to quantitatively assess the impacts that take limits are having on Delta exports. Given time and resource constraints, it is unlikely that EPA's revised analysis will be able to utilize this information. It is strongly recommended that the Board utilize this information for its impact assessment when it becomes available.

It is important to emphasize that physical capacity provides an upper bound on what may be achieved with transfers. The actual extent of transfer activity, however, could be substantially below this level due to institutional and legal constraints that

both slow the rate and increase the cost of perfecting transfers. The historic exchange agreement between Metropolitan Water District and Imperial Irrigation District, for example, took many years to negotiate. Potential gains from trades may be offset to a large degree by high transaction costs resulting from poorly defined water rights, environmental documentation requirements, and legal challenges. There is a high degree of uncertainty as to the extent that institutional constraints will limit transfers, both in the short-run and the long-run. This uncertainty needs to be acknowledged and accounted for by the impact assessment.

In this respect, EPA's revised analysis is deficient. It calls for two trade scenarios, a high-bound scenario and a low-bound scenario. The high-bound scenario assumes trades would occur up to the point of physical capacity, includes north-south trades through the Delta, and assumes no take limit restrictions. EPA would model this as the most likely long-run outcome. The low-bound scenario assumes only south of Delta trades occurring up to the point of physical capacity. EPA would model this as the most likely short-run outcome. Neither scenario accounts for institutional uncertainty, and as a result, each overstates what could be considered the expected level of transfers.

The experience this year with the State Water Bank illustrates the importance of institutional and physical constraints, and how this creates undue uncertainty. This year, ESA requirements have resulted in substantial uncertainty over Bank operations. Take limits have caused daily problems with pumping at both the Tracy and Banks pumping plants. According to DWR officials, the pumping environment is so uncertain that potential sellers to the Bank have been informed that there is no guarantee that deals will be consummated. At the same time, buyers are being required to pay up front for water DWR cannot guarantee it will deliver. Because of ESA requirements, water that is delivered will be moved through the Delta between August and October, after the peak irrigation season. This has required farmers wanting to purchase water from the Bank to reschedule water they would have received in the fall for summer delivery.

II. Key Issues Affecting the Agricultural Sector

This section discusses the key factors that condition the ability of production agriculture to respond to reduced water deliveries that must be addressed by the economic analysis. These include allocation rules for CVP and SWP deliveries to

agricultural contractors; groundwater access and cost; processor contracts, marketing orders, and other market constraints; reduced land values; and higher credit costs due to increased production risks. In addition, this section discusses the tendency for conventional methods to measure unemployment to understate labor displaced by reduced agricultural output.

1) Allocation rules for CVP and SWP agricultural contractors. The CVP and SWP allocate shortages to agricultural contractors according to priority rules. While these rules differ for each system, in both instances they result in an uneven distribution of impacts among project beneficiaries. Within the SWP, contractual agreements between SWP contractors give agricultural deliveries lower priority than M&I deliveries, resulting in more frequent and severe shortages for agricultural contractors dependent on SWP water. Within the CVP, agricultural exchange contractors receive first priority, then wildlife refuges and hardship M&I, and finally agricultural service contractors. This ordering concentrates project shortages within agricultural contractor service areas.

2) Groundwater access and cost. Several aspects of groundwater use must be accounted for by the economic analysis. Areas with access to groundwater can be expected to increase pumping rates to maintain production. The recent drought documented many such examples. Within the San Luis Water District, for instance, groundwater pumping increased nearly six-fold between 1989 and 1991.[3] In Westlands, pumping doubled between 1990 and 1991, from 300,000 to 600,000 acre-feet.[4] For the state as a whole, pumping is projected to increase 4.5 million acre-feet during drought years under current Delta operating criteria (DWR Draft Bulletin 160-93).

Producer surplus will decline in regions that increase their reliance on groundwater. Production costs within the San Joaquin Valley were estimated to have increased by approximately $219 million in 1991 due to increased pumping of groundwater.[5] The capital costs of new well production also represent a substantial cost increase for agriculture, often costing $50,000 or more per well. Some 25,000 new wells were

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[3] "Comments of Westlands Water District on Water Quality Standards for Surface Water of the Sacramento River, San Joaquin River, and San Francisco Bay and Delta of the State of California Proposed by the Environmental Protection Agency in the Federal Register of January 6, 1994," Westlands Water District, March 11, 1994.

[4] ibid.

[5] "Economic Impacts of the 1991 California Drought on San Joaquin Agriculture and Related Industries," Northwest Economics Associates. March 16, 1992.

installed in 1990 alone.[6] The immediate effect of a shift to groundwater will be a reduction in returns to land and management. In the short-run, this may place highly leveraged farms at significant risk to loan default. In the long-run, economic rents earned by land and management in these regions will decline in response to higher resource costs.

Long-term idling of acreage will concentrate in areas without access to groundwater. Several districts within the SWP service area that comprise more than 200,000 acres of productive acreage do not overlie aquifers. More than 45% of this acreage is planted to high-value fruits, nuts, and vegetables, which generate 10 to 20 times more employment and income than less input intensive field crops.[7] Long-term decreases in surface water supply reliability would result in significant reductions in employment and income in these areas.

In the long-run, increased reliance on groundwater would be expected to accelerate the rate of overdraft and significantly degrade the economic value of the resource. Increased pumping depths would diminish opportunities to conjunctively use the resource for improved allocative efficiency, and may lead to greater rates of subsidence and the loss of storage capacity.

3) Processor contracts, marketing orders, and other market constraints. It is important that the analysis not overstate the degree to which revenue losses due to reduced water shortages can be offset by substitution into high revenue vegetable, fruit, and nut production. While cropping choices are not completely inflexible, processor contracts, marketing orders, output markets, and government commodity programs dictate to a significant degree observed cropping patterns. In addition, substitution into orchard crops requires a lead time of several years before the trees are sufficiently mature to bear a cash crop.

4) Land devaluation. Lower farm profits will reduce land values that could result in considerable economic instability for some regions. Revenue to local government

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[6] "Final Comments of the Association of California Water Agencies on the Environmental Protection Agency's Proposed Water Quality Standards for the Bay-Delta," Association of California Water Agencies, March 11, 1994.

[7] Economic Impacts of the December 15, 1993 Proposed Federal Action on San Joaquin Agriculture, Northwest Economic Associates. March 11, 1994.

will also be adversely affected by a diminished property tax base. It is important to emphasize that EPA's economic analysis does not attempt to quantify these impacts.

5) Farm and water district credit issues. Westlands Water District's comments to EPA clearly demonstrate the growing importance of supply reliability for access to farm credit. In its comments, Westlands includes a letter from the Director of Agricultural Investments for Municipal Life Insurance Company of New York to U.S. Senator Dianne Feinstein regarding agricultural loan policies for areas served by CVP. A portion of that letter as contained in the comments by Westlands is reproduced herein:

1. Lands relying on CVP contracts for their sole source and supply are no longer considered to have a stable and uninterruptable supply of irrigation water and will therefore not generally be considered as acceptable security for lending.
2. Lands relying on CVP contracts as their primary source and supply shall only be considered as acceptable security for financing as they can show a viable alternative and independent supply, either pump or surface water, adequate to meet all of their irrigation needs on an extended or possibly permanent basis.
3. Lands proving groundwater as their back-up supply must provide evidence of the stability of the aquifer and its ability to recharge quickly following extended periods of heavy pumping, such as occurred during the recent six year drought. Groundwater in areas of chronic overdraft shall not be considered an acceptable backup water supply at any time.
4. Water transfers shall not be considered an acceptable backup water supply until implemented on a statewide basis with well established rules and in a manner assuring long-term availability at prices allowing production agriculture to operate on an economic basis. Water transfers are not expected to be a viable alternative supply for long-term loan underwriting purposes during this decade. (emphasis added)

In a similar fashion, agricultural irrigation districts face more restricted access to credit because of increased revenue volatility and liability issues associated with "take or pay" contracts for CVP and SWP water. In general, decreasing supply reliability is exerting considerable financial pressure on water districts and their customers. The extent of these impacts or ways in which they may be mitigated are not addressed by EPA's analysis.

6) Assessing agricultural unemployment. Conventional methods to measure agricultural employment losses associated with production adjustments tend to underestimate the actual number of displaced workers. Conventional models typically estimate unemployment in terms of full-time equivalent jobs. For most industries, it is standard to assume that one full-time equivalent job is held by one person (i.e., a full-time employee). For California agriculture, this assumption is not appropriate. Because of the high degree of part-time and seasonal labor, three to four times as many people perform farm work in California as there are full-time equivalent farm jobs.[8] It is therefore important to recognize that a policy that impacts 1,000 full-time-equivalent farm jobs, as might be reported by any number of commonly used regional economic models, may actually be affecting the livelihoods of as many as 3,000 to 4,000 workers and their families.

III. Key Issues Affecting the Urban Sector

This section addresses key issues affecting urban area responses to reduced surface water deliveries. These include regional representation by the analysis, availability and cost of alternative supply options, and financial risk for water agencies.

1) Analysis requires three or more representative urban regions . EPA's draft economic analysis included only one representative region from which to assess urban sector impacts. This produced implausible results by not considering key regional differences. Baseline shortages and alternative supply options differ in important ways by region and need to be accounted for by the analysis.

Two representative regions will be used to assess urban costs for the revised economic analysis — a southern California region (modeled on MWD) and a northern California region (modeled on SF-EBMUD-Santa Clara). While this improves on the earlier analysis, by excluding Central Valley urban areas from consideration, it is not sufficient to create a reasonable forecast of urban impacts.

Central Valley municipal service areas cannot be characterized using data for coastal cities for several reasons. First, cities in the Central Valley are expected to grow over the

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[8] Rosenberg, H. R., R. E. Garrett, et al. (1989). Labor and Competitive Agricultural Technology in 2010. Agriculture in California: On the Brink of a New Millennium Eds. H. O. Carter and C. F. Nuckton. University of California. 27-50.

next two decades at much faster rates than coastal cities, which will place added pressures on their water resources. Second, Central Valley cities rely on groundwater supply to a much greater extent than coastal cities. This raises unique issues, such as to what degree will increased pumping by agriculture translate into lower quality and higher cost groundwater for municipal use, and to what extent will areas that do suffer a loss of surface supply be able to replace it with groundwater. Third, conservation and reclamation — considered as proxies by EPA's analysis for local area supply options — do not result in a net addition in supply for Central Valley regions since outflow is already captured by downstream uses.

Given these considerations, a three-region assessment of urban area impacts — including a South Coast region, a Bay Area region, and a Central Valley region — would appear to be the minimum necessary to adequately address this category of costs.

2) Alternative supply. Calculations of alternative supplies to mitigate reductions in Delta exports need to account for existing claims on these resources. For example, DWR projections show water shortages in the South Coast region, not accounting for new standards for the Delta, increasing by 373,000 acre-feet, on average, between 1990 and 2020, despite implementation of level 1 water management options that include 281,000 acre-feet of reclamation (DWR Draft Bulletin 160-93). It would therefore be incorrect to assume — as EPA did in its draft analysis — that any of this additional reclamation supply would be available to mitigate Delta losses. To do so would be to double count supply sources. The same consideration should be applied to imports of supply from the Colorado River. To the extent that these imports are offsetting pre-existing shortages, they should not be counted as potential supply to mitigate impacts due to the standards.

3) Secondary impacts of urban residential water shortages. In addition to higher costs for water, shortages resulting from the proposed standards would impose out-of-pocket expenses on residential customers for such impacts as landscape losses. Additionally, losses to ancillary businesses should also be counted. For example, demand for goods and services of nurseries, landscape design, installation, maintenance and other "Green Industry" firms may be affected by reductions in water supply.

4) Water district finance. SWP and CVP M&I contractors, like their agricultural counterparts, have take-or-pay contracts that recover project fixed costs regardless of deliveries. In general, the high degree of fixed costs essentially creates a take-or-pay environment for any delivery system. As with agriculture, expected actions in the Delta are causing credit agencies to reassess their policies to finance short- and long-term debt for urban districts. A statement by Standard & Poor's as reported in *CreditWire*, dated June 24, indicates the direction the industry is headed:

> S&P believes that MWD and all of its customers will need to adopt policies regarding long-term drought allocations and rate methodologies within the next year in order to be able to absorb smoothly higher costs that will be driven by soon to be adopted standards for the Bay-Delta. Without some consensus and agreements, the [LADWP] and many other California water systems will face difficulty in their financial and operational planning that could hurt credit quality.

It is important to note that to the extent MWD's credit is adversely affected, the implications for credit could likely extend to all public sectors, not just those connected to the supply of water, since MWD anchors credit ratings for all public agencies in the western portion of the United States.

Actions in the Delta that result in more unreliable supplies for urban areas will significantly increase the financial risks associated with carrying fixed costs of delivery systems and can be expected to have long-term consequences for utility financial stability. These adjustments constitute an important category of impact that has been overlooked by EPA's analysis.

IV. Hydropower sector — Proposed methodology to estimate impacts

This section addresses the need to include hydropower and related losses in the analysis. This category of impacts is completely excluded from the EPA analysis. Because these impacts are potentially significant, ACWA and Northern California Power Agencies are jointly undertaking a project to provide quantitative estimates. This project is described below.

1) Why adjustments to hydropower operations need to be assessed. California has one of the largest hydroelectric power generation systems in the world. Changing flow requirements through the Delta will affect its operation in important ways. Standards will directly impact loads and power production along the CVP and SWP systems. Other hydropower plants may change their storage and release patterns as well, especially if flood control constraints change or requirements to provide flow relief in the Delta extend beyond the CVP and SWP. Additional groundwater pumping may increase system demands, particularly during peak summer months. At the same time, inexpensive surplus power from the Pacific Northwest is expected to decline due to fishery recovery efforts in that region, putting an additional premium on in-state hydro generation. Less peaking hydropower from the CVP and the SWP (the latter is often ignored in analyses) and increased load from groundwater pumping could require additional generation from more expensive gas fired plants.

Actions at Shasta to provide cold-water releases for anadromous fish species protection give some indication of the significance of hydropower losses. Over the period 1987 to 1993, Shasta power production has been reduced approximately 13% due to generator bypass to release cold water.[9] The present value cost of additional power purchases to replace this loss have totaled more than $44 million. This cost estimate does not account for the additional capacity purchases made by Western to fulfill contract obligations, or the efficiency losses caused by reductions in surface water elevations at the generators. Capacity costs are of particular importance because Shasta operations are mainly affected during peak summer months when capacity costs are much higher. For example, the cost of summer capacity per kilowatt-hour (kwh) is approximately four times as great as the direct energy cost per kwh for the Pacific Gas & Electric (PG&E) service area, and approximately three times as great as direct energy costs per kwh for the Southern California Edison (SCE) service area.

Studies of hydropower losses during drought also give some indication of potential impacts. One example is a study for EPA of the Pacific Gas & Electric (PG&E) service area that estimated an increase of $370 million in a single year for variable operating

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[9]"Shasta Powerplant Bypass Data," preliminary draft, June 17, 1994; and James C. Feider, Area Manger, Western Area Power Administration, "Comments to SWRCB Bay/Delta Workshop," June 14, 1994.

costs for utility generation due to hydropower losses given 1928 to 1934 drought conditions.[10]

It is important to emphasize the potential cost associated with shifting the generation of hydropower out of the peak summer months. Requiring additional Delta releases in early spring will reduce the amount of stored water for hydropower generation during the summer peak period. The following table illustrates the relative differences between summer peak and winter off-peak in marginal power costs for the PG&E and SCE systems:

	Cents/kwh	
	PG&E	SCE
Marginal Energy Costs		
Summer Peak	2.22	3.64
Winter Off-peak	2.65	2.06
Marginal Capacity Costs		
Summer Peak	8.32	9.87
Winter Off-peak	0.00	0.00
Net Difference - Summer vs. Winter	7.89	11.45

Source: California Public Utility Commission.

Based on an average rate of power production of 3,900 kwh per acre-foot, shifting the release of an acre-foot from summer peak to winter off-peak costs the PG&E system approximately $308 and the SCE system approximately $447. Shifting the release of 325,000 acre-feet, for example, would cost the PG&E system approximately $100 million.

In addition, water project curtailments have historically increased power loads about 750 gigawatt-hours— approximately 20% of the average agricultural load in the PG&E system. This increase occurs primarily during the peak summer season.

[10] Hanemann, W. M. and R. McCann (1993). Economic Impacts on the Northern California Hydropower System. Integrated Modeling of Drought and Global Warming: Impact on Selected California Resources Ed. N. G. Dowling.

Finally, it must be noted that the loss of hydropower will result in additional air emissions to the extent that it is replaced with power from fossil fuel burning generators. This additional cost is of particular importance to SCE, which provides power to the Los Angeles region. According to California Energy Commission data, the pollution offset cost is approximately $10 per kw-year, or about 1.6 cents per kwh. Based on the average rate of power production for PG&E's hydro system of 3,900 kwh per acre-foot, costs associated with additional air emissions could equal as much as $60 per acre-foot.

2) Hydropower impact assessment workplan. To date, this category of impacts has not been addressed systematically, though the tools to do so are available. Therefore, the Association and the Northern California Power Agencies (NCPA) are undertaking a study that will address the following issues:

- How will alternative standards affect operations of California's hydroelectric system;
- What costs are associated with these adjustments;
- How will changes in hydro generation affect the production and dispatch of non-hydro generated power;
- How will changes in groundwater pumping affect demand for electricity;
- What costs are associated with these changes.

The following workplan describes the method and scope of the project. Primary project tasks are as follows:

(1) Scenarios for current and projected flows necessary to meet Delta standards will be established for each hydropower system. Projected flows for CVP and SWP systems are being estimated by DWR for EPA's revised impact assessment; necessary flow changes for upstream facilities to accommodate downstream project requirements will be estimated for each river basin system using a flow adjustment model created for a U.S. EPA study on drought and global warming impacts. (Hanemann and McCann 1993)

(2) PROSIM and DWRSIM output will provide project pumping loads for the CVP and SWP. The latter is important because Oroville is the largest single hydro unit

supplying Southern California Edison (SCE). Monthly power generation and demand for each system will be tabulated.

(3) Linear program models for PG&E and SCE will be run to determine changes in releases, storage and generation for those systems. Monthly generation and flows will be tabulated. The models will be run in successive iterations with the Elfin dispatch model to account for the importance of seasonal price differentials for hydropower. The PG&E model was developed for the EPA study (Hanemann and McCann 1993); the SCE model was created for its ECAC proceedings.

(4) Changes in agricultural pumping are being estimated for EPA's revised economic assessment. This data will be used to estimate changes in loads due to increased groundwater pumping.

(5) Input data sets for Elfin of the PG&E, SCE and, if required, other municipal systems will be created using CEC Electricity Report information. (California Energy Commission 1992) The data sets from the CEC would require only minor modifications. The changes in hydropower generation, the increased agricultural pumping demand, and decreased project pumping would be incorporated into the model. Elfin will be used to forecast how the rest of the generation system will adjust to the estimated changes in hydro production, and how this will impact the overall cost of generation. The adjusted cost would be input into the hydropower linear programming models in (3) to iterate towards the least-cost generation dispatch pattern.

(6) The generation planning module of Elfin will be used, along with CEC cost assumptions, to determine how future generating capacity needs might change. The cost of these capacity additions would also be incorporated into the overall revenue requirements for each system.

(7) Air emissions from the mix of generating resources can be estimated with Elfin using data on emission rates provided by in the CEC Electricity Report. One way to calculate the economic cost of any net increase in emissions within critical airsheds would be to value them according to the projected price of RECLAIM trading credits since SCE and LADWP are participants in the program.

(8) Total economic costs of system adjustments can be calculated from Elfin revenue requirement output. Iterative analysis can be done by adjusting demand for response to changing prices or a simple consumer surplus estimate can be made.

Question 3

Should the SWRCB request the CVP and SWP to implement portions of the draft standards prior to adoption of a water rights decision?

As a practical matter, some of what the Board may prescribe in standards will likely be implemented by other agencies under requirements of the federal Endangered Species Act. Additionally, some water user interests have indicated a willingness to work with the Board in implementing standards early in the process.

These facts not withstanding, ACWA believes the Board should consider a number of factors before the CVP and SWP are asked to implement portions of the standards prior to a water rights decision, including the following:

1) The water rights process is likely to be lengthy, with an outcome that is far from certain. To the extent, and for the period that only the CVP and SWP are affected by the standards, the economic impact analysis prepared for the Board's consideration must fully reflect the additional economic impacts imposed by an early implementation.

2) The Board should resist the temptation to incorporate measures directed exclusively or primarily at recovery or protection of endangered species. Currently, ESA requirements are having a dramatic impact on water project operations, and some believe that an immediate solution for endangered species and water deliveries is to adopt standards that would focus on endangered species problems. However, given the uncertainty over the populations of endangered species and the unproven efficacy of measures proposed for recovery, there should be much more flexibility provided in species recovery plans than standards would provide. Additionally, ACWA believes that whatever standards are adopted should provide habitat improvements for species beyond those that are endangered.

3) The implementation schedule adopted by the Board may be as important as the substance of the standards. ACWA urges the Board to adopt an implementation schedule that provides the flexibility to adjust to changed circumstances, whether those changes are biological, regulatory or otherwise. To the extent that the Board asks the CVP and SWP to implement portions of the standards early, that request should be conditioned on orderly progress in related areas, such as the state-federal framework agreement, changes in requirements for endangered species protection, implementation of the CVPIA and other actions that will have significant impacts on the Bay-Delta estuary or those who depend on the estuary.

Conclusion

ACWA believes the State of California is in the best position to determine how its water needs should be balanced and its supplies allocated, particularly within the scope of a water quality standard-setting process. Since water quality standards and constraints on water project operations by themselves are an incomplete solution to Bay-Delta problems, a plan such as the Comprehensive Protection Program now being developed by the water community offers a more inclusive aproach than that proposed by EPA.

The water community intends to submit the Comprehensive Protection Program to the State Board for its consideration and adoption as soon as possible. In the meantime, ACWA and the Northern California Power Agencies will be forwarding results of the joint hydropower impacts study to the Board and to EPA.

ACWA and its members stand ready to assist the Board in a state-led process to develop a comprehensive program that protects Bay-Delta resources and incorporates the requirements of the CWA and ESA. The result must be a workable, implementable plan that provides for a healthy, stable Bay-Delta system and a reliable water supply for the cities, farms and businesses of California.