

Comments and Recommendations
Regarding
Feb – June Flow Objectives (Issue #8)
Of The
State Water Resources Control Board
Water Quality Control Plan
For The
San Francisco Bay/Sacramento-San Joaquin Delta Estuary

Submitted By:

SAN JOAQUIN RIVER GROUP

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I. INTRODUCTION

After the State Water Resources Control Board (“SWRCB”) adopted the 1995 Water Quality Plan for the San Francisco Bay/Sacramento-San Joaquin Delta estuary (“1995 WQCP”), the San Joaquin Tributaries Association filed suit, alleging that many of the flow dependent objectives were not based upon sound science. Now, as part of its review of the objectives contained in the 1995 WCP, the SWRCB has asked whether the flow objectives for the San Joaquin River for the period February 1 through April 14 and May 16 through June 31 (“February through June Flow Objectives”) should be amended. Since the February through June Flow Objectives (1) were not originally based upon sound science or accurate assumptions for salmon, (2) are not supported by the new science cited by proponents of the objectives, and (3) are not necessary for the protection of San Joaquin River salmon smolts, the San Joaquin River Group Authority (“SJRG”) recommends that the February through June Flow Objectives be eliminated.

Several parties introduced a variety of data, hypotheses and alleged correlations in an effort to show that more flow in the San Joaquin River is better for salmon smolts. While these may be enticing, it is only because they appear to support what is intuitively thought and believed by the proponents that more flow is always better. However, a hard look at the science demonstrates that the alleged correlations between increased flow in the San Joaquin River and salmon smolt survival simply cannot be justified based upon the current data. Current science does not show, no matter how strongly it is felt, believed or desired in the heart or “gut” of the proponents, that there is a statistically defensible relationship between flow in the February through April 14 and May 16 through June 1 timeframes and salmon smolt survival through the Delta.

The SWRCB's focus should be on the challenges faced by outmigrating salmon smolts in the Delta. Only by understanding mortality factors affecting outmigrating smolts in the Delta, such as tidal influences, export pumping, migration pathways, predation and barrier operations, can the SWRCB establish a suite of flow and non-flow actions specifically designed to reduce in-Delta mortality and improve outmigration success. There are credible and serious scientists that are looking at such mortality factors and recommending adaptive management activities that will both assist in salmon smolt migration through the Delta while improving the body of science regarding the factors affecting such migration. The SWRCB should embrace the idea of improving migration through the Delta, possibly including the amendment of the salmon narrative objective to focus specifically on measurable factors within the Delta.

II. ARGUMENT

A. Restatement of Position

The SJRGA recommends that the February through June Flow Objectives all be eliminated or, in the alternative, that the May 16 through June flows and the February flows be eliminated. This position was made clear in the SJRGA's presentation on March 21, 2005 and for the sake of brevity shall only be summarized here.

1. The February Through June Flow Objectives for Salmon Smolts Are Not Based Upon Sound Science for Salmon But Were Instead Intended for Delta Smelt

As explained in the SJRGA's submittal on March 21, 2005, in the events that culminated in the 1995 WQCP's February through June Flow Objectives, the initial focus was on San Joaquin River flows that would protect salmon smolts. (SJRGA EXH 19). Of the four alternatives evaluated, three of them – submitted by the United States

Environmental Protection Agency, the SWRCB staff and the California Department of Fish and Game (“CDFG”) – focused exclusively on the 30-day April-May pulse flow period and did not include any discussion of flows in the February, March and June time periods. Only one of the four alternatives – the flows agreed to in the 1994 Bay-Delta Principles for Agreement – looked at flows beyond the 30-day April-May pulse flow period. Unfortunately, these flows were eventually adopted by the SWRCB as the February through June Flow Objectives.

As is now well-known, the negotiations that lead to the Principles for Agreement were closed to both San Joaquin River interests as well as fishery scientists. (*Id.*, p. 3). As a result of the political settlement the Principles became, without a scientific review of the problem, the recommended flow structure, which structure is fatally flawed for two reasons:

First, although the intent was to protect Chinook salmon smolts in the San Joaquin River, the recommended and adopted flows are *identical* to the San Joaquin River protection measures identified by the United States Fish and Wildlife Service for the protection of **Delta smelt**. (*Id.*, p. 4, citing USFWS, Formal Consultation and Conference on Effects of Long-Term Operations of the CVP and SWP on Threatened Delta Smelt, Delta Smelt Critical Habitat, and Proposed Threatened Sacramento Splittail, March 6, 1995, p. 17). Thus, the February through June Flow Objectives adopted by the SWRCB focused on an entirely different fish species than was originally contemplated by the SWRCB staff, the USEPA and the CDFG.

Second, even assuming that the goal of protecting Delta smelt somehow trumped or superseded the goal of protecting San Joaquin River chinook salmon smolts,

something for which the SJRGA has little or no responsibility, the flows themselves are not based upon any scientific study or inquiry specifically related to the needs of Delta smelt. Instead, the flows that were selected for the San Joaquin River merely represent a percentage of what is required for Delta outflow. That is, in wet and above normal years, the San Joaquin River requirement is 30% of Delta outflow, in below normal and dry years, the San Joaquin River requirement is 20% of Delta outflow, and in critical years the San Joaquin River requirement is 10% of Delta outflow. (*Id.*, p. 4). While this relationship makes the San Joaquin River flow easy to calculate, and just as easy to predict, it is very simplistic, having little or nothing to do with the amount of flow that Delta smelt need or would actually get.

2. There is No Real Correlation Between San Joaquin River Non-Flood Flows and San Joaquin River Salmon Smolt Survival Through the Delta

Although it may seem intuitive to some that increased flow from the San Joaquin River would improve salmon smolt survival through the Delta by decreasing travel time, the data shows otherwise. Indeed, the research by Dr. Peter Baker and Dr. Emil Morhardt demonstrated that Delta inflow has little if any effect on salmon smolt travel time. (*Id.*, p. 7, citing Baker, Peter F. and J. Emil Morhardt. *Survival of Chinook Salmon Smolts in the Sacramento-San Joaquin Delta and Pacific Ocean. Contributions to the Biology of Central Valley Salmonids. Fish Bulletin 179, Vol. 2 (2001)*). The reason for this is two-fold. First, tidal flows are enormous when compared to San Joaquin River flows and have a profound effect on the movement of salmon smolts into and through the Delta.

(Appendix A, p. 2-3, 11-15).¹ Second, San Joaquin River smolts face a variety of difficulties in migrating through the Delta, including poor water quality, entrainment, predation and simply getting lost or delayed as a result of flow reversal in the southern Delta. (Appendix B, p. 2; Appendix A, p. 8-11).

This second issue is of extreme importance when it is considered that very little of the San Joaquin River flow actually contributes to Delta outflow. When the Head of Old River Barrier is not in place, the vast majority of flow at Vernalis end up at the CVP and SWP export pumps according to studies performed by Flow Science, Inc. (SJRG EXH 19, p. 10; SJRG EXH 4, Fig. 12 and 13). Indeed, in 1964, it is estimated that 78% of the San Joaquin River water that flowed past Vernalis ended up at the export pumps, with only 21% remaining for net Delta outflow, consumptive use and evaporation. Similarly, in 1988, it was estimated that 62% of the water at Vernalis went to the export pumps, with 37% remaining. (SJRG EXH 4, Fig. 12 and 13; [The Public Review Draft of the California Water Plan Update 2005 reports that average year 2000 Delta Region Consumptive Use (Gross Channel Depletion for Agriculture, M&I, Wetlands, ET) was 1,690,000 acre-feet. (Table 12-2 at p. 12-26)]. The actual path traveled by Vernalis flows fits in nicely with movement of smolts through the Delta revealed in the radio-telemetry studies of juvenile salmon migration in the Delta done by Natural Resource Scientists, Inc. (Appendix A, p. 3-12). Indeed, it is now known that once salmon smolts move into the channels south of the San Joaquin River, many do not re-emerge to the mainstem to continue their migration toward the ocean. (*Id.*, p. 7-15).

¹ It is likely because of the massive tidal influence that a better predictor of salmon smolt travel success through the Delta is smolt size. Stillwater Sciences has found a clear relationship between travel time and smolt size. (See SJRG EXH 19, p. 7-8, citing Baker, Peter. Statistical methods for estimating time travel and survival applied to groups of Chinook salmon released near the head of Old River and Jersey Point and recovered in Chipps Island trawls (February 2005)).

Further examination of water years 1964 and 1988 shows an even bleaker picture. In 1964, during the February 1 through April 14 time period, 95% of the San Joaquin River water entering the Delta was exported. (Appendix C, p. 6-8). During the same time period in 1988, 96% of the San Joaquin River water entering the Delta was exported. (Id.). These represent dry and critically dry year types, respectively. (Id.).

February flow at Vernalis in 1964 was 1759 cfs; in February 1988, February flow at Vernalis was 1440 cfs. (SJRG EXH 7, p. 23). March flow at Vernalis in 1964 was 929 cfs, while March flow at Vernalis in 1988 was 2240 cfs. (Id.). It is reasonable to assume in dry and critically dry year types that farmers in the southern Delta are diverting water. (SDWA estimated diversions of approximately 1400 cfs per day in July (SDWA Ex. 22, p. 2 [submitted as part of D-1641 proceedings])). Needless to say, the low flows, no barriers and high pumping cause Delta hydraulics to move South and West. Given these conditions, it is doubtful that San Joaquin River salmon smolts entering the Delta in dry and critically dry year types have any chance of remaining in the mainstem of the San Joaquin River and successfully migrating to the ocean.

While it may be true that good conditions for outmigration of San Joaquin River smolts are associated with flood events on the San Joaquin River (Appendix B, p. 2), these events are characterized by massive, unmanaged flows well in excess of 10,000 cfs. As such, there is no relevance of such flows in evaluating the importance of managed flows as nothing about flows at this level is manageable. Indeed, when these years are removed from the statistical regression analysis of San Joaquin River spring flow and escapement 2.5 years later, such as the analysis posited by The Bay Institute (“TBI”), the portrayed overall correlation is eliminated. (Id., p.3).

- 3. May 16 Through June Flow Standards Should Be Eliminated**
 - a. These Flows Will Not Protect Salmon Smolts**
 - (i) Will Not Effectively Reduce Water Temperatures**

Various studies have identified water temperatures of 54 F or less as optimal for salmon smolt survival, while CDFG considers water temperatures of 64 F or higher to be considered lethal to Chinook salmon smolts. (SJRG EXH 19, p. 11, citing Marston, Dean. Stanislaus River Water Temperature Criteria Development and Application for Chinook Salmon and Steelhead, 2003).² It has been suggested that San Joaquin River flows in the May 16 through June time period are necessary to reduce water temperatures below lethal levels. (*See, e.g.*, DFG EXH 8, p. 26). However, implementation of this suggestion is simply infeasible.

In 1990, E. Huntley of the Department of Water Resources (“DWR”) testified before the SWRCB that, based upon modeling done by the United States Bureau of Reclamation (“USBR”), “the quantities of water that would have to be released from storage would be huge and probably impossible to make.” (SJRG EXH 19, p. 11).³ More recent studies conducted by S.P. Cramer and Associates demonstrated that additional

² The reference to a lethal temperature of 64 F in SJRG EXH 19 was not intended to advocate that any particular temperature be established in the San Joaquin River to protect outmigrating salmon smolts. Rather, such reference was intended to demonstrate the amount of water that would have to be released from upstream reservoirs and the inability to control temperatures in the San Joaquin River. SJRG EXH 19 referenced Stanislaus River Water Temperature Criteria Development and Application for Chinook Salmon and Steelhead (2003), a report of the Stanislaus Temperature Model Technical Advisory Committee which evaluated a 64 F temperature as part of an overall temperature study on the Stanislaus River. The report did not recommend that a temperature of 64 F be maintained on either the Stanislaus or San Joaquin Rivers to protect outmigrating salmon smolts.

³ SJRG EXH 19 also shows that while it is possible to reduce temperatures in the tributaries in late May and June by releases of water from the reservoirs, it is a waste and unreasonable use of water and makes no sense to do so for the following reasons. First, the number of smolts remaining from late May through June is small when compared to the total number of outmigrating salmon. Second, in most water years, any remaining smolts that could move out of the tributaries and into the San Joaquin River would be faced with what CDFG classifies as lethal temperatures in the lower San Joaquin River.

flows from the Stanislaus River would not materially alter or reduce temperature in the San Joaquin River and Delta. (Id., p. 12, citing Fuller, Andrea. Memo to Stanislaus River Fish Group re Supplemental Flows Proposed for late May, (May 4, 2004)). This analysis demonstrated that despite additional releases from the Stanislaus River between May 28 and June 30, 2003, the average daily water temperatures at Vernalis remained above lethal levels, even though the temperature of the Stanislaus River water was in the optimal range. (Id., p. 12, citing Fuller, Andrea. Memo to Stanislaus River Fish Group re Supplemental Flows Proposed for late May, (May 4, 2004) Fig. 8 and 9).⁴

In 1991, the SWRCB recognized that reservoir releases designed to control water temperature would be a waste of water. (1991 Water Quality Control Plan, Table III-3, fn. 4). There is no new information that has changed this conclusion.

(ii) Salmon Smolts Already Gone

It is undisputed that the vast majority of salmon smolts would have already migrated before the May 16 through June time period. For example, CDFG has recognized that 50% of smolts out-migrate during the 31 day VAMP window. (DFG EXH 08, p. 2). Studies by S.P. Cramer and Associates on the Stanislaus River noted that 75% of salmon migrate by May 7. (SJRG EXH 19, p. 13). Similar results have been found on the Merced and Tuolumne Rivers. (Id.). Finally, salmon salvage at the CVP and SWP facilities show that few salmon are salvaged after May 31. (Id.; *see also* DFG EXH 08, p. 2 [prime outmigration ends May 31]).

⁴ SJRG EXH 19 demonstrated the impact on New Melones storage and the inability to effectively reduce San Joaquin River water temperatures at Vernalis by attempting to control temperatures using Stanislaus River releases. Releases from the Tuolumne and Merced Rivers would likely require much greater amounts of water due to the warming effects of the ambient air temperatures in late May through June and the distance between those rivers and the Delta. As stated in SJRG EXH 19, “such releases are not likely to have any significant effect on Vernalis water temperatures.”

Moreover, while it may be true that some smolts migrate during the May 16-June timeframe, there is no indication that additional flow will assist in their survival. As noted above, temperatures in the lower San Joaquin River and Delta often exceed what CDFG considers to be lethal levels after May 15. (average daily temperature at Vernalis above 67.5 F May 28-June 30, 2003 despite additional releases (SJRG EXH 19, p. 12, citing Fuller, Andrea. memo to Stanislaus River Fish Group re Supplemental Flows Proposed for late May, (May 4, 2004), Fig. 8 and 9); temperatures at Jersey Point in excess of 68F throughout May 2004 (SJRG EXH 19, p. 12-13)). Since additional flows will simply not be sufficient to lower the water temperature below what CDFG considers to be lethal levels for salmon smolts, there is simply no thermal justification to try to have flow requirements for any stragglers that outmigrate after May 15.

b. May 16-June Flows Will Not Protect Delta Smelt

The May 16 through June flow requirement was originally part of the Delta smelt biological opinion, but it was not designed or intended to rectify harm being caused to Delta smelt as a result of inadequate flows on the San Joaquin River. To the contrary, this requirement was expressly designed and intended to transport Delta smelt through the Delta *while allowing continued exports from the SWP and CVP*. (SJRG EXH 19, p. 14). Thus, the May 16 through June flow requirement is not a biological imperative, but rather mitigation for effects from the export facilities. When trying to set flows based upon what the beneficial resources need, as is being done in the current proceeding, it is not appropriate to set mitigation flows. Consideration of mitigation flows should be part of a subsequent hearing focusing on implementation of the necessary flows.

When looking at what the smelt actually need, it becomes clear that they do not need additional flow from the San Joaquin River. CDFG townet survey data shows that while smelt are in the Delta in late May and June, they have already moved away from the San Joaquin River and are concentrated near the Sacramento River, in the western Delta and in the Suisun Bay. (SJRG EXH 19, p. 14). Additional San Joaquin River flow will provide no benefits to these fish. Even assuming that some Delta smelt are still in the southern or central Delta, additional San Joaquin River flow will not assist in their migration since, as has been noted repeatedly, most San Joaquin River water that passes Vernalis does not travel through the Delta to the San Francisco Bay, but rather travels southwest within the Delta towards the SWP and CVP export facilities. (SJRG EXH 04, Fig. 14 and 15).

B. Rebuttal

1. CDFG

During the public workshop, the CDFG submitted what, at first glance, appears to be a scholarly paper recommending that (1) the flow target window be expanded to April 1 through May 31, (2) the minimum flow target be increased above 3200 cfs and (3) the frequency of the minimum flow target level is substantially decreased. (DFG EXH 08, p. 24). Indeed, the submittal is replete with charts, graphs, scatter plots, calculations and other analyses that the CDFG describes as “sufficiently robust” to support their recommendations. (*Id.*, p. 25). However, a more focused examination of the submittal, and a review of the oral presentation provided by Mr. Dean Marston during the workshop, reveals that the CDFG’s submittal is nothing more than a compilation of misleading, unsubstantiated and highly speculative analyses designed to support CDFG’s

unabashed belief that more flow results in more fish.⁵ As such, the SWRCB cannot modify the current March through June Flow Objectives in reliance upon the CDFG’s submittal.

a. CDFG Does Not Trust Its Own Analysis

Despite the purported “science” presented to support the CDFG’s recommendations, CDFG’s written submittal contains a variety of subtle hedges that demonstrate that the CDFG itself is not all that confident in its own science. CDFG acknowledges that rather than conducting studies and reviewing data, and allowing the results to determine CDFG’s recommendations, as is typically done by neutral parties unbiased by their beliefs, the CDFG started with the “hypothesis” that San Joaquin River basin salmon production is “largely influenced” by flow and then conducted their analysis. (DFG EXH 08, p. 6). Despite the dizzying array of charts, graphs, plots and other visuals contained in their submittal, CDFG repeatedly notes that they have conducted only a “simple” model/assessment/analysis (Id., p. 6, 10, 19) that never actually proves anything, but merely “suggests” (Id., p. 6, 10, 16,) that increases San Joaquin River basin salmon are “theoretically possible” with additional flow. (Id., p. 24).

In fact, if the submittal is read closely, CDFG expressly acknowledges their lack of faith in their own “analysis.” On page twenty (20), after 19 pages of “analysis,” CDFG begins a paragraph with “*If* this hypothesis [more flow equals more salmon] is true...”

⁵ Mr. Dean Marston testified during the workshop that “a higher VAMP target would equal more adult salmon. A longer VAMP period would equal more adult salmon. A longer duration in combination with a higher magnitude would increase more adult salmon and fewer 3,200 targets would result in more adult salmon.” (RT, March 21, 2005, p. 1448). Similarly, Mr. Jim White testified that it is a “fact that higher flows will increase salmon production and improve the size of the population.” (Id., p. 1455). Apparently, it does not matter how they get more flow, when they get more flow, or for how long they get more flow. As far as CDFG is concerned, the key concern is simply getting **MORE**.

(Id., p. 20)(emphasis added). Later, CDFG refers to their “analysis” as oversimplified predictions for which it does “not include confidence limits.” (Id., p. 25).

Perhaps the biggest reason to reject the CDFG submittal as unreliable, and indeed not even accepted by CDFG itself, is the testimony of CDFG employee Mr. Dean Marston. During his oral testimony, Mr. Marston stated that the “simple model” used by CDFG “has not been peer reviewed outside” CDFG, and therefore if he were sitting in the shoes of the SWRCB his recommendation would be “*don’t bet the farm on it...*”(RT March 21, 2005, p. 1444)(emphasis added). What is most disturbing about Mr. Marston’s admission is that while Mr. Marston apparently would not bet his farm on the material submitted by CDFG, he is expressly asking that the SWRCB bet other people’s farms on it. Whether or not Mr. Marston was aware of the sad irony of his comment at the time it was made, the fact of the matter is he could not have provided a more revealing comment if he had tried. While the SJRGA is not advocating or suggesting that scientific certainty be the standard upon which future SWRCB actions be based, it does urge the SWRCB not to rely upon information that even the submitting party finds insufficient to support the changes it advocates.

b. Outside Review of CDFG Analysis Confirms CDFG’s Own Lack of Faith

Since the CDFG admitted that their own material had not been reviewed by anyone, let alone an expert, outside of the CDFG, the SJRGA retained S.P. Cramer & Associates, Inc. to review it. This review, which is attached hereto in its entirety as Appendix D, demonstrates that the CDFG’s lack of faith in its own analysis is completely

justified, S.P. Cramer & Associates, Inc. found CDFG's submittal less than compelling due to

- misrepresentation of smolt migration relative to flow in the Vernalis Adaptive management Plan (VAMP) period
- flow management considerations not addressed outside the VAMP
- limited sample size
- unsubstantiated survival rate estimates
- lack of confounding effects other than flow (e.g., temperature, fry migration, exports)
- inference outside the range of the predictive data set
- reliance on strictly linear relationships without the consideration of density dependence
- unsupported inclusion of production as a function of flow in compound escapement estimates
- the use of Sacramento Basin to estimate adult cohort abundance
- unconventional calculations of percent increase for various metrics
- the lack of supporting evidence for smolt survival as a function of flow reflected in the returning adult escapement cohort
- additional concerns regarding flow projections, data exclusion criteria and effectiveness assumptions. (Id., p. 1-2).

Each of these findings is discussed in detail in the appendix, and such detailed explanations need not be repeated here. Suffice it to say, S.P. Cramer & Associates, Inc. concluded that “CDFG’s analyses should be considered highly speculative.” (*Id.*, p. 1).⁶

The CDFG submittal makes it clear that CDFG believes that more flow at Vernalis will materially benefit San Joaquin River basin salmon smolts. This belief, no matter how sincere, is simply not enough to justify amendments to the February through June Flow Objectives where, as here, there is no sound science supporting such “belief.”⁷ Until CDFG is willing to risk its own farm on the adequacy and accuracy of its analyses, the SWRCB should not be asked to risk anyone else’s.

2. The Bay Institute

a. TBI’s Analysis Is Overly-simplistic and Not Very Helpful

Not surprisingly, TBI recommended revisions to the March through June Flow Objectives greatly increase the amount of flow required at Vernalis. (TBI EXH 9, p. 10). The SJRGA retained ENTRIX, Inc. to review the TBI recommendations. ENTRIX’s review is attached hereto in its entirety as Appendix B, and includes a detailed critique of TBI’s data, interpretation of data, and recommendations. ENTRIX believes that TBI has

⁶ The blatant inadequacy of the science supporting CDFG’s proposed amendments to the March through June Flow Objectives demonstrates why the SJRGA is advocating the SWRCB make a greater effort to either refuse to admit evidence into the administrative record, or identify that evidence in the administrative record that is simply unreliable. (*See* SJRGA’s Comments and Recommendations Regarding Southern Delta Electrical Conductivity Objectives (Issue #10) of the State Water Resources Control Board Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (June 3, 2005), page 65-72). In the absence of such actions by the SWRCB, parties will no doubt later cite to the CDFG submittal as “evidence” favoring increased flow in the San Joaquin River in future litigation and the courts will be powerless to comment on the adequacy of such “evidence.”

⁷ CDFG expressly stated that it does not manage for salmon fry. (CDFG EXH 08, p. 27; RT March 21, 2005, p. 1450). Since salmon fry emerge in the San Joaquin River tributaries in January and February, this failure to manage for fry explains why CDFG does not have any flow recommendations for February or March. (*See* CDFG EXH 08, p. 3, 29). Given this lack of management for fry, there is no reason for the SWRCB to require any flow in February or March, since salmon and steelhead smolt outmigration is between April 1 and May 31. (*Id.*, p. 25; RT March 21, 2005, p. 1448).

not provided sufficient justification for their recommended changes to the March through June Flow Objectives.⁸

Of ENTRIX's several criticisms of TBI's submittal, three are significant enough to warrant mentioning here.

First, much of TBI's work is based upon a comparison of the hydrology of the San Joaquin and Sacramento River systems. (See TBI EXH 9, p. 2-4). TBI asserts that because Sacramento River salmon populations are growing, while San Joaquin River salmon populations are not, and both populations remain in the Pacific Ocean for comparable amounts of time, "freshwater habitat conditions in the San Joaquin Basin are a limiting factor for San Joaquin Basin salmon." (TBI EXH 9, p. 3). ENTRIX, however, points out that there are substantial differences between the San Joaquin and Sacramento River systems that make such comparisons virtually worthless. From the differences in hydrology, drainage complexity, number of tributaries, availability of spawning habitat, number of hatcheries and ease in navigating the Delta to the ocean, there are a multitude of factors that can explain the differences between salmon populations on the San Joaquin and Sacramento Rivers. (*Id.*, p. 1-2). Failure to recognize, let alone discuss, these significant differences in the two systems makes the TBI analysis extremely speculative, simplistic and unreliable.

Second, TBI attempts to relate Vernalis flow with escapement, and thereby migration success. (TBI EXH 9, p. 3-4, 18, Fig. 5). This attempt fails for two reasons. A. As noted above, TBI's correlation of high flows is dependent upon seven (7) specific years where flows were massive, unmanaged flood events. (Appendix B, p. 2) If these

⁸ TBI bases their recommended flow on the 1995 Anadromous Fish Restoration Plan papers #1 and #2. (TBI EXH 9, p. 8, Table 2). As discussed by Tim Ford of Stillwater Sciences, the resurrection of such flow recommendations is completely inappropriate. (Appendix E, p. 1).

events are removed from the analysis, there simply is no correlation between Vernalis flow and salmon outmigration. (Id.). B. Year class survival is dependent upon a variety of issues other than flow at Vernalis, including Delta mortality factors such as water quality conditions, entrainment, and predation. (Id.). None of these additional factors was recognized or discussed by TBI.

Third, TBI's analyses and conclusion are based upon flawed CDFG data regarding escapement. Specifically, the proposed relationship between escapement and earlier downstream migration is based upon an assumption regarding the gender and size of the returning salmon. (Id., p. 3). However, the CDFG data that TBI uses does not include confirmation of size and age necessary to evaluate the accuracy of the proposed relationship. (Id.). Thus, TBI's reliance on such data is premature at best, and possibly completely inappropriate.

b. TBI's Flow Recommendations, If Accepted, Would Bankrupt New Melones Reservoir

In addition to being unnecessary from a biological standpoint, TBI's flow recommendations are simply not feasible as they would bankrupt New Melones. After receiving the TBI flow recommendations, the SJRGA retained Daniel B. Steiner to analyze such flows. A complete copy of Mr. Steiner's analysis is attached hereto as Appendix F.

Mr. Steiner compared TBI's proposed flows with the "Current Conditions-No Caps IPO" scenario, which assumes that all flow and water quality objectives at Vernalis will be achieved by New Melones. (Id., p. 1). Significantly, Mr. Steiner's comparison found that

“during the 1987 through 1992 drought period an additional 410,000 are-feet of water is needed to comply with the proposed flow objectives, over and above full compliance with current objectives. ***Sufficient water in New Melones Reservoir does not exist to satisfy this supplemental requirement.*** Sufficient water also does not exist in New Melones Reservoir to satisfy the cumulative supplemental requirement during the hydrology of the 1920s/1930s assuming the continuance of the other water supply objectives of the IPO.” (*Id.*, p. 2; *see also* Table 6)(emphasis added).

This extreme water cost is of no apparent concern to TBI, and is directly related to TBI’s fascination with historic flows. (*See, e.g.*, TBI EXH 9, p. 2). During the workshop itself, Chairman Baggett expressed his exasperation with TBI’s understanding of the current, as opposed to historic, situation, commenting

“Historic flows are great. It is fine that is what it used to look like. I don’t think anybody is going to sit here and say it is proposed that we take out all the dams in the San Joaquin River...So, given the state of what we’ve got, the population, can you help us make some sense of this?” (RT March 21, 2005, p. 1517).

Unfortunately, despite Chairman Baggett’s plea, TBI nonetheless presented flow recommendations that simply do not take into consideration the current situation, or other beneficial uses of water, as Mr. Steiner’s analysis clearly demonstrates.

3. National Marine Fisheries Service

The National Marine Fisheries Service (“NMFS”) made no explicit recommendations, but stated only that it is concerned that the current March through June Flow Objectives “may be too low” and asked that the SWRCB consider increasing the current objectives. (NOAA EXH 17, p. 21; RT March 21, 2005, p. 1400). This suggestion is unreasonable for two reasons.

First, the very purpose of the SWRCB's workshop on the issue of the March through June Flow Objectives is to consider changing such objectives, including increasing them. Thus, it is simply not useful, during a process expressly established to consider changing the objectives, for one of the fishery agencies responsible for regulating salmon and steelhead to participate by suggesting that the SWRCB consider changing the objectives.

Second, and more importantly, however, is the sheer disingenuousness of the NMFS position. In 2004, NMFS and the United States Fish and Wildlife Service ("USFWS") completed consultation with the USBR regarding the USBR's Long Term Central Valley Project Operations Criteria and Plan ("OCAP"). (SJRG EXH 19, p. 8). The biological opinions that resulted from such consultation found that the OCAP, including the continued operation of the New Melones Reservoir in accordance with the Interim Plan of Operations ("IOP"), would not result in jeopardy to endangered salmon, steelhead or Delta smelt. (Id.). The "no jeopardy" opinion was given despite the fact that the modeling demonstrated that the current March through June Flow Objectives would not be met in 16 months (all in February, March or June) of the simulated 73 year period of record. (Id.).

In light of NMFS' "no jeopardy" opinion regarding the USBR's performance of the OCAP, including the IOP, which is not expected to meet the current March through June Flow Objectives, NMFS' "concern" that the current standard may be too low is simply not credible.

4. USFWS

Much like its sister-agency NMFS, the USFWS essentially made no recommendation, but merely suggested that the March through June Flow Objectives be maintained. (USFWS EXH 40, p. 11). And much like NMFS' suggestion, this suggestion is difficult to understand given that the USFWS also agreed to the "no jeopardy" opinion regarding the USBR's OCAP.

What is most disappointing about the USFWS submittal is the service's continued discussion of "natural flow." (*See, e.g.*, USFWS EXH 40, p. 7; *see also* RT March 21, 2005, p. 1377). While comparisons of today's conditions to allegedly natural conditions are expected from environmental groups, such as TBI, that have no established regulatory mandate and are therefore free to espouse whatever view they see fit, such comparisons are not appropriate from the USFWS. Simply put, there is no legal, regulatory or other requirement to restore the San Joaquin River salmon populations to "natural" or "historic" levels. Even the mandate to double the production of natural salmon takes into account the existence of fully developed tributaries and the existence of the Friant Project on the upper San Joaquin River. (PL 102-575 Section 3406(b)(1) calls for doubling average levels attained during the period of 1967-1991). Discussions about what would have existed "naturally" without such development, and recommendations based upon such discussions, are simply irrelevant and should be rejected.⁹

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⁹ *See* Appendix E, p. 1.

C. SJRGA Has A Different View for Evaluating and Solving the Delta's Problems

1. SWRCB Focus Should Be on the Delta Mortality Impacts to Outmigrating San Joaquin River Salmon

The parties advocating the continuation of, or additions to, the February through June Flow Objectives see the problem regarding salmon and other aquatic species in simple terms. According to them, there simply is not enough water. Having defined the problem in such a simplistic fashion, their proposed solution – more flow – is equally simplistic. However, the SJRGA believes that the problem itself is far more complex, and considers the notion of simply providing more flow to be equivalent to the notion of throwing money at a problem and expecting the problem to be solved. Just as throwing money at a problem is at once the easiest, most expensive and least effective solution, so too is simply advocating the provision of additional flow.

Unlike the parties advocating the continuation of, or additions to, the February through June Flow Objectives based upon the belief that more water equates to more fish, the SJRGA suggests that the problem must be fully understood before a solution, or suite of solutions, can be proposed. As is discussed at length above and in the appendices hereto, it is undisputed that San Joaquin River salmon smolts face a variety of challenges in migrating to the ocean, including export pumping, entrainment, predation, water quality, and simply getting lost in the myriad of Delta channels, sloughs, ditches and canals. The SWRCB should not accept the recommendations of CDFG, TBI, NMFS, USFWS and others and simply call for more flow while ignoring other, possibly more culpable, challenges for outmigrating salmon. The SJRGA is acutely aware that the SWRCB cannot stand idly by and do nothing while more research and studies are

conducted. As Chairman Baggett exclaimed, “we are going to make a decision based upon the best science and the best information that is before us now, not ten years from now.” (RT March 21, 2005, p. 1457-1458). The solution, then, is to require a series of actions and studies that are designed both to improve conditions for San Joaquin River fish moving through the Delta and to evaluate the various challenges such fish face in order to better understand migration through the Delta and how it can be improved.

Of course, the SJRGA is already on record for championing just such an approach, as they were the primary advocate for the Vernalis Adaptive Management Plan (“VAMP”) which is suite of flow and non-flow actions designed to provide additional flow during the April-May pulse flow period while evaluating the relationship between migration, flow, the Head of Old River Barrier and export pumping. While the VAMP experiment is not quite half finished, and has provided valuable data while providing additional water for fish as intended, it seems apparent that there may be gaps in the information being generated that further study via the VAMP itself will not fill. In the SJRGA’s view, the SWRCB should seize the opportunity not simply to require additional flow and blindly hope for more fish, but to utilize the principles underlying the VAMP to require parties to engage in both flow and non-flow actions targeted to improving both San Joaquin River salmon survival and the science regarding salmon migration through the Delta.

Mr. Dave Vogel of Natural Resource Scientists, Inc. has written a paper examining the effects of hydraulic conditions in the Delta on salmon migration. (A complete copy of Mr. Vogel’s paper is attached as Appendix A). Looking at such things

as tidal and flow information, the results of the VAMP experiment to date and radio telemetry studies of salmon within the South and Central Delta, Mr. Vogel concluded that

“a significant portion of San Joaquin salmon mortality occurs because fish are diverted off the mainstem San Joaquin River in high proportions, primarily at Turner Cut and Columbia Cut.” (Id., p. 15). Unfortunately, “the mechanisms explaining how and why salmon smolts can be diverted off the mainstem San Joaquin River into channels of the south Delta remain unknown.” (Id.).

To better understand salmon migration pathways through the Delta as well as site-specific conditions such migrating salmon confront, Mr. Vogel recommends an intensive investigation centered on the use of salmon tagged with acoustic transmitters as performed on the Columbia River. (Id., p. 16). Mr. Vogel indicates the data loggers not only record where the fish are, enabling the migration paths to be tracked, but also create a time stamp, enabling researchers to plot how fast fish are traveling and better evaluate the impact of flow direction, velocity and other factors on migration. (Id.). Once the data loggers are fixed, a variety of different releases can be performed to take advantage of certain tidal situations, water project operations, barrier operations and/or flow conditions. (Id., p. 16-17).

The purpose of including the recommendations of Mr. Vogel is not necessarily to endorse them in their entirety, although the SJRGA believes that they have merit and deserve serious consideration for implementation. Rather, the purpose is to demonstrate that there are credible and serious scientists who are looking at the mortality factors within the South and Central Delta for outmigrating San Joaquin River salmon and to focus the SWRCB’s energies into solving this *Delta* problem. Since this proceeding is designed to look at altering or amending the 1995 WQCP for the Bay-Delta, it is the

SJRGA's opinion that the SWRCB should be focusing on the Delta itself, and more specifically on (1) determining why so many fish are suffering mortality in the Delta, and (2) what specific action or suite of actions can be undertaken to reduce or eliminate these Delta mortality factors. The SWRCB could go a long way to meeting both of these goals if it accepted the recommendations for studies and monitoring contained in this filing and its appendices that focus on salmon survival through the Delta.

2. The 1995 WQCP's salmon Narrative Objective Improperly Focuses on the Tributaries Instead of on the Delta

Although the 1995 WQCP was designed and intended to prescribe certain actions to benefit salmon within the Bay-Delta estuary, the salmon narrative objective's use of the "production" of salmon as the measuring stick of progress has inevitably lead to interested agencies and parties focusing not on conditions in the Bay-Delta estuary, but in the ocean and the tributaries.¹⁰

Virtually every party that has participated in this proceeding by recommending either no change in or an increase to the February through June Flow Objectives has attempted to justify its position using a presumed simple statistical regression between flow at Vernalis and escapement. (See CDFG Exh 8, p. 1-30; TBI EXH 9, p. 3, Fig. 3-5; USFWS EXH 40, p. 6, 8-9; NOAA EXH 17, p. 3-7). Escapement is measured not in the Delta, but rather in the upstream tributaries. (Appendix G, p. 11). The reason these parties focus so much on escapement, as opposed to other measurable factors within the Delta is because salmon production is the sum of the recreational and commercial catch plus escapement. (California Fish and Game Code section 6911). As is now clear, the

¹⁰ A more complete discussion of this issue can be found in the SJRGA's submittal entitled "San Joaquin River Group Authority Observations and Comments on the Salmon Narrative Objective" attached hereto as Appendix G.

combination of the narrative objective's use of "production" as a measuring stick and use of upstream escapement as the primary metric for measuring "production" has resulted in the unintended consequence that salmon survival in and through the Delta is determined by factors measured wholly outside of the Delta. By extension, this has resulted in parties suggesting objectives and regulations that do not address conditions in the Delta directly, but rather in the upstream tributaries.

Salmon production is dependent upon many variables, including the quality and quantity of spawning and rearing habitat, ocean conditions, harvest, predation, and outmigration. The salmon narrative objective contained in the 1995 WQCP was not designed or intended to require actions to address all of these variables, but only on those that affected the migration of salmon through the Delta. (Appendix G, p. 11, citing Statement of Decision (May 5, 2003) at page 82, *State Water Resources Control Board Cases*, Case No. JC 4118). Despite this, the resource agencies and environmental parties are using escapement to evaluate and critique the SWRCB's standards specifically designed to improve migration through the Delta. This is akin to comparing apples and oranges. It cannot simply be stated that if escapement is not sufficient, additional flows from the tributaries will remedy the problem. Indeed, the evidence indicates a myriad of other within Delta mortality factors, not San Joaquin Basin flow, cause the problem.

As part of this process, the SWRCB must re-focus its energies and those of the regulated community (including the resource agencies) away from such misguided efforts and back to ideas and actions designed to evaluate and improve salmon migration **through** the Delta. Direct measurement of salmon through the Delta is possible, and has occurred for many years. (Appendix G, p. 11, citing SJRGA's "2004 Annual technical

report on the Implementation and Monitoring of the San Joaquin River Agreement and the Vernalis Adaptive Management Plan). If the parties are unable to redirect their energies in accordance with the spirit of the 1995 WQCP's salmon narrative objective, then the SWRCB should amend the 1995 WQCP and replace or re-word the salmon narrative objective to focus specifically on measurable factors within the Delta.

III. CONCLUSION

For all of the above reasons, the SJRGA recommends that the SWRCB eliminate the February through June Flow Objectives in their entirety. If the SWRCB finds this is not feasible, then the SJRGA recommends that no standard be established for June (CDFG recommends extending window only through May 31) or February (CDFG does not manage for fry).

Regardless of the flow standard actually adopted by the SWRCB, the SJRGA recommends that any required actions include real time monitoring, an operable Head of Old River Barrier, export reductions whenever fish of concern are likely to be unreasonably impacted, and short-duration pulse flows designed to maximize the effects of group migration, tidal cycles and pumping restrictions. The SWRCB must focus on these and similar activities specifically designed to identify and address the multiple mortality factors impacting salmon outmigration **through the Delta**, and not simply require higher flows and far greater impacts to the water community in the blind and possibly useless hope that they will be sufficient to subsume all other Delta mortality factors for salmon.

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Respectfully submitted

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